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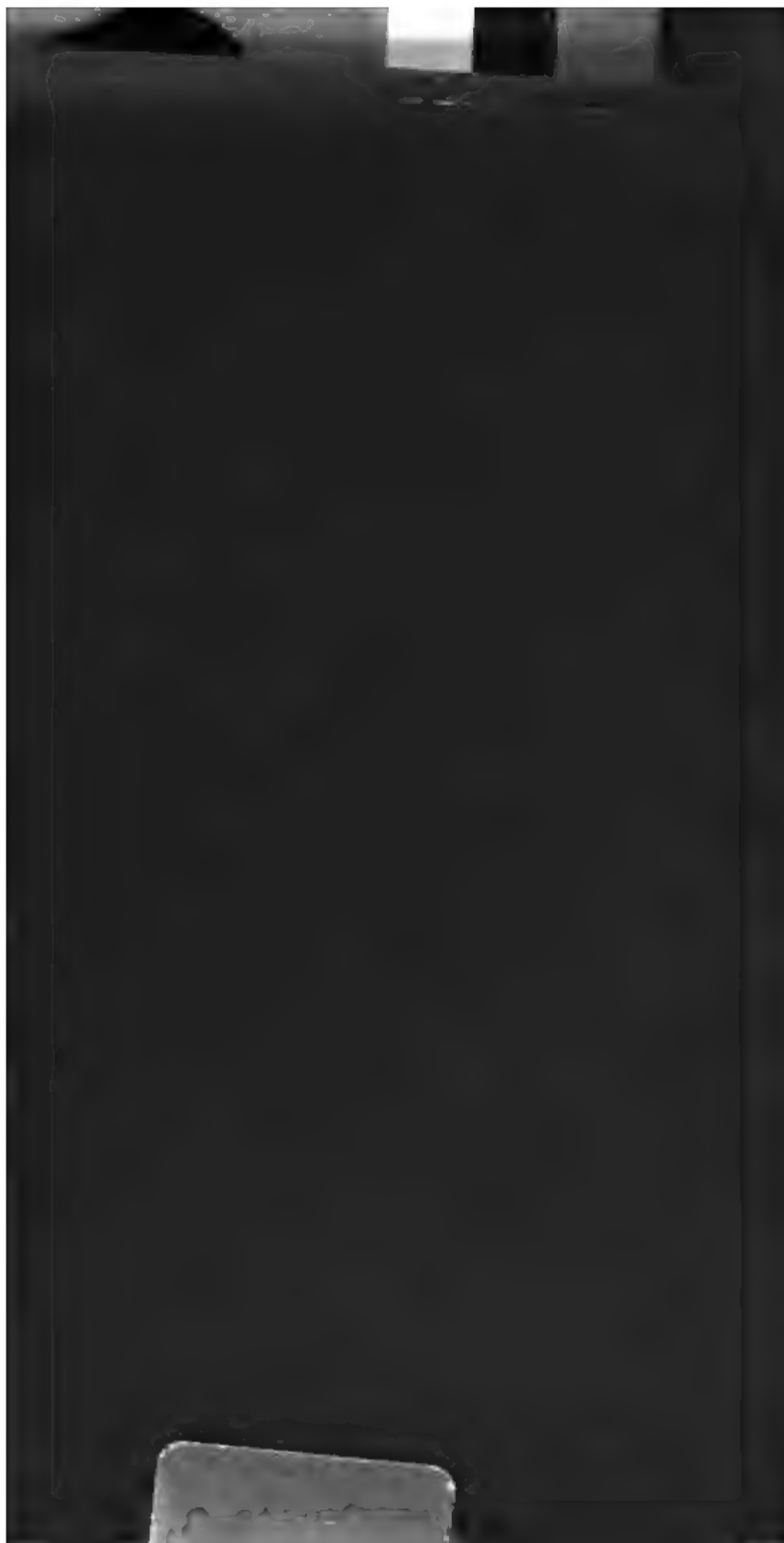
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**FRUIT  
BETWEEN THE LEAVES**



**FRUIT**  
**BETWEEN THE LEAVES**

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**"CURIOSITIES OF CIVILIZATION," "OUR SOCIAL BEES," "PEEPS INTO  
THE HUMAN HIVE," ETC. ETC. ETC.**

***IN TWO VOLUMES***

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## TO THE READER.

SOME of the Papers in these Volumes have already appeared in the 'Edinburgh Review,' the 'Graphic,' 'The Pall Mall Gazette,' 'Good Words,' and other publications. That the reader after their perusal will not find that the title belies him, is the hope of

THE AUTHOR.

*Chestnut Lodge, Chiswick.*



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# FRUIT BETWEEN THE LEAVES.

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## CLEVER DOGS.

THOSE who have the largest experience of dogs,—who know well their ways,—by degrees acquire a most implicit faith in their intelligence, and mildly give it as their opinion that they are possessed of a modified kind of reason. Why the poor animal should be but grudgingly allowed a quality that all two-footed animals, however stupid, are assumed to possess, we never could clearly understand. There is nothing, we trust, derogatory to the dignity of man that the faithful four-footed beast should possess in common with him a quality the former often uses to so ill a purpose. As far as the limit of his capacity goes,—for we do not allege that a dog can reason out a problem in Euclid,—we believe that a Skye terrier will often use it far

more directly to the purpose in view, than many a biped; and, as regards the special senses, it is notorious that the canine race leave man far behind. How many men are there who make their living by the mere aid of their powers of smell, like the hound? How many, like the pointer, can direct you to an invisible object a hundred yards off? Again, in the qualities of courage and tenacity, what is the heroism of a soldier who does a deed of daring on the field of battle, to the daring of the bull-dog, who will pin a lion by the nose, or hang on to his lip whilst he is being torn to shreds by the kingly beast? We confess that many of our qualities, both moral and physical, seem but small when contrasted with those of our poor four-footed friend proved to us by well-authenticated anecdotes. The attachment of the dog to man, a quality which few other animals share with him, even in a modified degree, has made him the hero and the participator in some of our most romantic tales. Who does not remember the ballad of 'Beth Gêlert,' the noble hound who slew the wolf in defending the chieftain's child, and who was slain in return as his supposed murderer? Or of the story of Helvellyn of our own day, in which the dog remained by his dead master, killed in crossing the mountain? This poor animal continued close to the body for three months, and was found there when the remains were discovered. As the place was far removed from any source

of food, it was often wondered how the dog, a terrier, maintained life so long. Mr. Jesse tells us that he interrogated a shepherd on the mountains how he could have accomplished this, and the answer, although perfectly natural, certainly lessens some of the romance of the story. "If he could not get enough to eat in the surrounding birds and game, how was it that he was found alive by his master's side after so long a time?" "Aye, aye," said the shepherd, "he ate him, that's how it was." An answer, however repugnant to our feelings, which was still consistent with the fidelity of the dog; if, indeed, he had not done so, how should we have even known that he had kept watch over his charge so long? The generosity of the dog may be illustrated by innumerable anecdotes, but, unfortunately, in private life this trait of his character but rarely gets recorded; it only happens when the brute is the friend and companion of some great man that we hear little touches of his private biography. One of these historical dogs, if we may be allowed the term, was Boatswain, who had the good fortune to have Byron for a master. It is recorded of this noble beast that he had as his mate-fellow a little fox terrier (belonging to the poet's mother) whom he was perpetually worrying; so much so that his mistress was fearful that he would be killed. In order to prevent this, Golpin, for that was his name, was sent off for protection to a tenant. But Boatswain, who

seemed to partake of that human failing so common to us, of not knowing the value of a friend until he is gone from us, was shortly missed from his home, and was seen to return joyfully with the little terrier, with whom he ever lived afterwards at peace. Although we give the dog credit for infinite cleverness, it sometimes happens that little stories are told about his doings which would seem to imply that the narrator credited him with a recondite reasoning power, which is scarcely compatible with the particulars of the case; but the following story is a good instance of the profit a beast of this kind will take out of a little experience. The dog of a gentleman was in the habit of dozing on the lawn of his master's house, which commanded a fine view of a neighbouring valley. In this valley was a kennel of harriers, and it often happened that a chased hare sought shelter whilst being pursued in the grounds, and was caught by the dog and brought to its master, who, like a good sportsman, always made a point of returning it to the huntsman when the harriers appeared,—a line of conduct the dog certainly did not approve of, for on one occasion when he had caught the hare he carried it to a laurustinus bush at some little distance from the house. He then attracted his master's attention to the bush, who took it up; the hounds in due course scented the hare up to the bush, but were then at fault, and failed to visit the house on this occasion, which the dog did not fail to

rejoice at, with every canine method of showing that he had foiled the huntsman and had secured the game. The affection that pet dogs will sometimes exhibit towards cats, we are all familiar with who have kept those animals ; the spaniel and puss lying cuddled up to each other before the fire makes the foreground of many a hearth pleasant and home-like ; but dogs will at times show a far more active love of puss, and will on occasions display the most genuine traits of humanity in rescuing cats from the persecution of those cruel little animals—boys. The ‘*Sporting Magazine*’ gives an instance where some rascals having beaten a cat, dragged it through the water and were attempting to drown it, when a dog, who had been for some time watching them, rushed forth to the rescue, seized the cat, took it away from its tormentors, and bore it away to its quarters ; here the dog made up a bed for it, compassionately licked it, lay down by it, and, having attracted the people of the house to it so that it was supplied with warm milk, it assiduously watched over its charge until it was quite recovered. We fancy there are few so-called Christians who would have done so much for an entire stranger, especially one supposed to be removed from their sympathy by the antipathy of race, such as we generally find to be the case between the cat and the dog. As we have said, dogs are sometimes credited with recondite motives for their acting, which, if they were fully be-

lieved, should make us give them credit for being moralists and for having a due care for their masters' souls. Southey tells an anecdote of a Methodist dog, who regularly went to chapel, although pelted by the church boys for so doing. His master, it appears, never went, and the interpretation put upon the dog's conduct was that he wished to attract his master, and engage him thereby to visit the place, when, hearing the Gospel, he might have been enlightened, converted, and finally saved. But, unfortunately, the master was drowned, and the dog from that time never entered the chapel doors ; but, if the dog really conducted himself in such an edifying manner, he surely may have given his example of chapel tending to other members of the backsliding flock. We have yet another story which would seem to credit this noble animal with the petty jealousies which occur now and then among different Christian sects. The dog in question, a large bloodhound, was accustomed to go with the household to the parish church, where he behaved demurely enough, lying down without making the slightest noise. On one occasion, however, a stranger happened to officiate, and had just gone within the altar rails to read the Commandments, when the dog followed, "placed his fore paws on the rails, and gave utterance to a fearful bay." The clergyman precipitately fled into the vestry, and the dog was ignominiously expelled from the church, and

kept chained up for several succeeding Sundays, until after a time this restraint was discontinued. But we are told the animal never after this attempted to go to church from which he had been expelled; but his attentions were only transferred. It was observed that the dog disappeared as usual on Sunday morning, no one knew whither, until at last one of the members of the family was accused of sending the dog to a neighbouring chapel to disturb the devotions of the congregation. It appeared that the dog regularly appeared at chapel every Sunday, where he behaved quite quietly, but the nervous people of the congregation were sore afraid of his presence. The lady of the household to which the dog belonged, was offended, it appears, that the dog should have demeaned himself to attend chapel, and henceforth he was chained up every Sunday and prevented from attending any place of worship at all. In most country towns there is a dog famous for some trick or habit; at Barryhead there was a large Newfoundland dog that regularly attended every funeral that took place in the neighbourhood. How the animal knew when such processions were to take place was always the wonder, but immediately the funeral *cortége* appeared in the road leading to the church, he issued forth, took his place as chief mourner immediately after the coffin, and accompanied it until it was finally deposited in the grave and the service was finished, and then quietly walked home again.

We have said that cats and dogs, notwithstanding the old saying, are sometimes very good friends. Southey tells a tale of a cat and dog that were so attached to each other, that, upon the household removing, they travelled together on foot for thirty miles, "the cat under convoy." Mr. Jesse, who has collected a large number of anecdotes of this animal, in the last work he wrote, 'Researches into the History of the British Dog,' from which we have largely quoted, says that a Bombay officer in an infantry regiment informed him that he had two dogs and a Persian cat; one of the dogs always slept with the cat. Whenever the cat saw a strange wild dog enter the captain's quarters, it used to hurry to its companion in the kennel, wake him up, and direct his attention to the strange dog, whereupon he gave chase to it, much to the satisfaction of the cat, who watched with approval the extrusion of the intruder. This dog was also noted for a peculiarity which is not common to his species; he seemed to possess very strong paternal affections. His habit was to keep guard over his pups whilst the mother was absent; but his master having taken him with him to the sea-coast at Mandavie, in Cutch, he was missed after the second day, and upon inquiry it was found that he had found his way home, and had taken up his old position in the basket as the guardian of the puppies. The method by which dogs manage to find their way home from

long distances across a country they have never travelled before is one of the most marvellous things in natural history. It seems quite to equal the instinct of the carrier pigeon ; but it is evident this bird is directed to its home in some manner by means of sight, as it never darts on its homeward path until it has made a survey of the horizon by means of the wide circle it makes in the air at a great altitude. The dog has no such aid, but it never fails to make its way home, when it wishes to do so, at very long distances. Among the numberless anecdotes of the instinct of dogs in finding their way home, we give the following :—A little black-and-tan terrier was taken by an officer from its home at Tolethorp Hall to the camp at Aldershot, a distance of a hundred and eighty miles by railway ; upon arrival at his new quarters the dog seemed uneasy, and was finally lost, and a reward was offered for its restoration, but nothing was heard of him. The officer in writing to his mother deplored the loss, but was agreeably surprised to find by her reply that the dog had returned home in good health, but very thin. Now, the dog had never been from home more than a few miles before, and how he managed to go such a distance without any guide is one of those mysteries “that no fellow can understand.” Whether or not he followed the track of the railway it would have been curious to find out. If he had, it would have been an instance of reasoning power ; if

not, it would have been equally curious to know how he could find his way by cross roads, directed by unerring instinct towards home as surely as the needle points the pathway to the polar star.

That dogs communicate tricks and habits to their posterity is without doubt; pointer puppies will point a few months after birth without receiving any instruction, and other dogs have been known to transmit points of "education" to their posterity. We know this faculty is given to man, we need not therefore wonder at its being developed in the dog also. We are surprised, however, to hear of eccentricities on their part which remind us of the tricks young girls of morbid tendencies are sometimes given to indulge in. Thus we hear of a brown terrier, in county Wicklow, who swallowed crooked pins whenever they were given to him. He did not like the pins plain, and that is the curious part of the business. When he received them, he would bend them with his teeth before swallowing them. We are told that the pins did not appear to have any effect upon his health, but, it is added, that they made him "very cross-grained." But there is on record a more eccentric act still, and one which we should think unparalleled—a dog deliberately committing suicide. The story is this: the landlady of a hotel at Honfleur found it necessary to have a seton passed through the neck of a little Havannah dog for some complaint from which he

suffered. This operation so annoyed the dog that it escaped from the house, rushed to the sea, swam out a little distance, put its head under water, and was drowned. Before believing this story we should like to know what the complaint was for which the seton was applied. It is more than possible that the dog had some head disease which terminated in apoplexy, and the suicide was only a fancy of the proprietors.

The truffle-hunter, a small dog bred from the French poodle, is an example of dogs having a special sense for the discovery of this particular fungus. There are some men who have special powers of appreciating a valuable hop by the sense of smell, but then the article has to be brought to their nose. The truffle-hunting dog, on the contrary, with a most unerring scent, will go straight up to the ground where a truffle may be buried, and will dig it out without fail. There must be a marvellous power of scent in these dogs to smell out these delicacies through the loomy earth in which they are buried. Although very fond of them, they never eat them, being trained not to do so. Would bipeds be so self-denying? We question it. The wonderful sagacity of the shepherd dog in dealing with the sheep he has charge of is very remarkable. An old shepherd will know every member of his flock individually; this is a very remarkable gift, but it is nothing to that of the dog, who will, upon his master's call, single out and bring home any particular sheep

that is required. The dog has not only to know the sheep, but to understand the commands of his master and to execute them ; no such easy matter when it is considered that he often has to force his way among a whole flock, and to select his sheep under the utmost possible difficulties.

The affection of dogs to others of the same species is also illustrated by the following curious anecdote. A greyhound in Sterlingshire, having a larger litter than she could well bring up herself, deliberately went out and hired a wet nurse to help her. The reader may stare at this, but it was literally the fact ; the bitch she brought home to assist her in her natural duties was a common Collie bitch, which came at regular stated times, and was rewarded for her services by having served out to her by the mother a supply of meat and bones. Mr. Jesse says that when a dog has lost its master in a crowd, it seeks for him rather by scent than by sight ; this is the secret, he informs us, of the rapidity with which the sheep dog will select a sheep from amid a flock, as we have heretofore mentioned. It is certainly remarkable that he should be able to recollect the scent of each sheep among the thousands he has to watch. A story is told of a dog that was given by his master in charge of his clothes whilst he went bathing. On returning from the water the dog failed to recognise him, owing, it was supposed, to the suppression of the odour of his body arising

from the contraction of the perspiratory ducts from the cold water, and also from his different appearance when naked. Be that as it may, the dog resisted the man's attempt to regain his dress, and the dog flew at him and was the cause of his death. This anecdote is very singular, but we doubt its truth, inasmuch as the face of the man would have been sufficient to secure recognition from any dog that knew its master.

We cannot help noticing an anecdote quoted by Southey, with respect to a celebrated nobleman, which shows how cruel a gentleman of refinement can be.

The late Duke of Northumberland took great pride in his King James spaniels, which were solely in his possession. He appeared to be very fond of them, and certainly prized them very highly; but we may appreciate the true value of his liking by the conclusion of the anecdote. "He never travelled without two of his favourites in the carriage. When at Worksop he used to feed his eagles with the pups; and a stranger to his excessive pride in the race, seeing him one day employed in thus destroying a whole litter, told His Grace how much he should be delighted to possess one of them. The duke's reply was a characteristic one. 'Pray, sir, which of my estates should you like to have?'"

It is singular that Southey did not see the absurd contradiction implied in this anecdote. If the duke really took a pride in the race, what was the reason of

his destroying them in this barbarous manner? Had he been a common man, he would have been liable to be imprisoned for his disgusting cruelty.

Most of the dogs we now possess were mentioned in Shakespeare's plays by name, with one exception, which for the last half-century has been the fancy dog, *par excellence*, of the roughs of the country—the bull-dog. The first mention that has been found of this dog, according to Jesse, is in the public records in a letter from Prestwick Eaton, from St. Sebastian, to George Willingham of St. Swithin's Lane, in 1631, when among other things he desires, are two good "bull dogges;" but they were known in England before that time, as Eaton wishes that they may be procured from the Bear Garden, where bulls, as well as bears, were baited from a time much anterior to this date. The baiting of bears and lions took place early in the reign of Henry the Eighth, and was continued until the last century. The conduct of the dogs in all cases, even from the earliest date, was precisely that of a bull-dog. They made for the nose of the animal, whether it was a bear or lion, and pinned the beast with the most undaunted courage, holding on even when it was near death. This fact seems to point to no dog but the bull-dog, but it could not have been known by that name, otherwise Shakespeare would most certainly have mentioned it. It may have been the mastiff, or the bandog which was used for baiting

beasts ; indeed, we find it termed a bull-mastiff. The bull-dog of the present day is sadly degenerated from those of forty years ago, both in size and gameness. In the last century he was a much larger animal than the toy dogs under that name the fancy disport them with, in dog-matches. When the bull-dog was required to pin a bull to the ground he did so by his weight ; a dog of seventy pounds caused such agony whilst his teeth was in the muzzle of the animal, that he dared not attempt to lift him ; with the little bull-dogs of the present day the bulls of old would have made short work. They are so over-bred that all their original good qualities are lost.

Bull baiting in this country was carried on in some places as late as the year 1836. In 1802 a bill to prevent this horrible pastime was thrown out on the second reading in the Lower House. It really seems wonderful that the humanity of gentlemen should have been at so low an ebb at that date, for the baiting had degenerated into the most wanton cruelty to the poor bull. In the previous year a bull was baited at Bury St. Edmunds which, previous to the dogs being set upon him, had his horns pulled off, so that he fought as well as he could with his bleeding stumps ; fires were lighted under him to prevent his lying down when fatigued with the combat, spikes thrust into his tenderest parts, and his tail twisted to dislocation to urge him on to the combat. The Englishmen

who witnessed it, must have been brutal beyond the brutality of the days of Nero. Martin's Act put an end to all this disgusting cruelty, but dog-fighting still continues in secret, and some of the better class than the mere fancy do not decline to join in it. The last lion baited in England was at Warwick in 1825, when the lion Nero, a docile and kind animal who had earned a livelihood for his master, was allowed to be set upon by three bull-dogs. The lion behaved with such magnanimity that even the spectators cried shame upon the proprietor. After disabling two of the dogs, the third dog, named Turk, was left alone to fight with the mighty beast, and he showed certainly the pluck and indomitable courage of his race.

“A most extraordinary scene then ensued ; the dog, left entirely alone with an animal of twenty times its weight, continued the battle with unabated fury, and though bleeding all over from the effects of the lion's claws, seized and pinned him by the nose at least half-a-dozen times ; when at length releasing himself with a desperate effort, the lion flung his whole weight upon the dog, and held him lying between his fore paws for more than a minute, during which time he could have bitten his head off a hundred times over, but did not make the slightest effort to hurt him. The dog was withdrawn, but he ultimately died.” The wonderful gameness of the bull-dog none can deny, but in this instance all the sympathy was with the noble lion who

so magnanimously took no mean advantage of his tremendous power.

The admiration of a certain class of the population for the bull-dog was a few years ago only another instance of the power which the qualities this dog possesses, over the instincts of what we may politely term the physical tastes of the lower class of the population. It will, perhaps, scarcely be believed that women often gave that nourishment to favourite bull-pups that should have gone to their own children. Even the man was in the eyes of the Fancy inferior to the brute, and its education was supposed to be cheaply purchased at the pain of its human teacher. This was reversing the old theory that beasts were made for the sport of men, with a vengeance ; but that it was so we cannot help quoting the following anecdote from Mr. Jesse's volume—an anecdote we have heard repeated with gusto by more than one dog-fancier.

“ A sporting character having a bull-dog whelp, and being anxious to see if he possessed the instinctive property of his race, asked a friend to go on his knees and hands in the parlour, and imitate the bellowing of a bull ; the whelp was let in, and incited by its owner, flew on the friend and seized him by the nose. The latter, astonished and affrighted at the painful onslaught, roared for help, and endeavoured to choke off his assailant ; on which his entertainer, in an agony of

apprehension for the future career of his *élève*, exclaimed in tones of mingled indignation and expostulation, 'What, mon, what! Woot spoil the poop? Let him taste the bleude, mon—let him taste the bleude.' ”

## KEW GARDENS.

CAN we wonder that the citizens of London have for ages been drawn, as if by some irresistible impulse, westward; beckoned onward, as it were, by the splendid beauty of the setting sun? In our own time we have seen the famous Gardens of Vauxhall, where Pepys tells us the nightingales used to sing so sweetly, swallowed up in the advancing tide of brick and mortar, and Kensington Gardens, where, within the memory of many middle-aged men, squirrels were as plentiful as blackberries, are now caged in by a suburb, until they are not more retired than a square in Bloomsbury. Westward still the great wave of human life is advancing, until our last open space yet, thank God, open to the pure country fields in the form of a public pleasure-ground, is in the Royal Gardens at Kew. Like the Hampton Court Palace Gardens,

they have flourished under the favour of the Crown for many reigns, and the forest-like pleasure-grounds have had time to form a deep setting of noble trees round the Botanical Gardens, brilliant with flowers and exotic plants gathered from all quarters of the globe. It is true they did not pass into the possession of the Crown until the beginning of the last century, but for a century before, a residence known as Kew House, with these grounds, was in the possession of Lord Capel, and from him fell into the hands of Mr. Molyneux, who married his daughter, the Lady Elizabeth Capel; so that these noble grounds, at least as far as the Arboretum or forestial portion is concerned, have been in careful cultivation for at least two hundred years. Mr. Molyneux's connection with the Court, as Secretary to the Prince of Wales, son of King George II., and father of George III., appears to have drawn the attention of that Prince to the charming situation of these grounds, and induced him in the year 1730 to take a long lease of them from the Capel family. At that time the estate consisted of about 250 acres, bounded, to speak broadly, by the Richmond Road, the old Royal Deer Park, and the river Thames. In the time of George II., when these grounds were first laid out for his son, the Chinese fashion in gardening was in vogue, and the grounds round the present lake by the Palm-house were designed after the fashion of the picture in the old-

fashioned willow-pattern plate. In the old lake there was an island crossed by an apparently inaccessible Chinese bridge, not far off a Chinese *Tai* House, and, as if to give a still more cosmopolitan character to the grounds, a Turkish Temple and an Assembly Room, the style of which, as set forth in Sir William Chambers' perspective view of it, it would be hard to guess at. The Great Pagoda, however, which still stands in handsome preservation some little distance off, in the midst of the Arboretum or pleasure-ground, is the only vestige of this Sinesian garden folly of the eighteenth century now remaining. The classical folly still exists. Sir William Chambers, as we all can see, capped artificial mounts with Temples of the Wind, Temples of the Sun, Temples of Victory and Minden; now either entirely empty or tenanted by a stray bust or two of departed heroes, which look wonderfully cold and miserable in their deserted shrines.

These so-called classical temples and buildings in the Gardens were erected under the direction of the Princess Augusta, the relict of the Prince of Wales, by whom the exotic department of the Garden was commenced. All vestiges of her glass stoves have, however, given way to new buildings more fitted to the advanced appliances of our day; one noble building, however, still remains—the old Orangery, a heavy but imposing-looking conservatory (marked by the date 1761 over the portal of the building), where once

the blooming fruit flourished, but now devoted to specimens of Colonial timber. Under the guidance of William Aiton, the author of '*Hortus Kewensis*,' published in 1789, the gardens were enriched with a large number of foreign plants. During his time and that of his son, W. Townsend Aiton, Esq., who was an especial favourite of George III., these gardens were the receptacle of the riches in horticulture collected and brought over by Captain Cook, Sir Joseph Banks, and Captain Flinders, in their voyages round the world. In addition to these, Mr. Allen Cunningham brought home from Australia many rare plants, and the expeditions of Bowie and Masson to Brazil and to the Cape of Good Hope furnished the Gardens with singular products of the Southern Hemisphere. With the reign of the poor blind king (who, by the way, spent the last years of his life in the quaint old red-brick palace seen from the lawn) the value of Kew Gardens as a scientific centre of botanical and horticultural science gradually declined, the two succeeding monarchs taking little interest in the establishment, and spending but little upon it. With the first years of the present Queen's reign, during which such vigour seemed to be infused into the scientific life of the nation, the first movement was made which transformed the Gardens from an effete royal establishment into the noble grounds which, under its able directors, has become the most famous botanic garden in

Europe. In the year 1838, in consequence of the general feeling that the Gardens should be placed upon a different footing, and thrown open to the public as a great popular and scientific institution, at the instigation of Lord John Russell, a Committee was appointed to inquire into their management and condition. In 1840 the inquiry resulted in a report by Dr. Lindley, which recommended that the Royal Botanic Garden, the pleasure-grounds, and the Richmond Deer Park should be transferred to Her Majesty's Woods and Forests, and this arrangement was immediately carried out; but subsequently the management has been divided between two departments, the Gardens and pleasure-grounds passing to the Works and Public Buildings Department, and the remainder to the Woods, Forests, and Land Revenue Office. The Botanic Gardens in 1841 received as its Director, on the resignation of Mr. Aiton, Sir William Hooker, and from the day of the advent of this distinguished botanist the fame of the national establishment immediately began to reassert itself. The proposal of Dr. Lindley, in his report to Government, gradually, under the care of this distinguished Director, became an established fact:—"A National Garden ought to be the centre round which all minor establishments of the same nature should be arranged: they should all be under the control of the chief of that garden, acting in concert with him, and through

him with one another, reporting constantly their proceedings, explaining their wants, receiving their supplies, and aiding the mother-country in everything that is useful in the Vegetable Kingdom. Medicine, commerce, agriculture, horticulture, and many valuable branches of manufacture would derive much benefit from the adoption of such a system. From a garden of this kind Government would be able to obtain authentic and official information on points connected with the founding of new colonies; it would afford plants there required, without its being necessary as now to apply to the officers of private establishments for advice and assistance." In order to give space for these improvements, however, considerably more room was required than could be found in the original Botanic Gardens, which at the time of the transfer from the Crown consisted of only eleven acres. This portion of the old Royal Domain was at once opened to the public, together with its Plant-houses and museums, as they then existed. These inadequate limits were soon increased by the grounds immediately about the Orangery and the Conservatory, which gave an additional four acres; the Pinetum was subsequently added by the Queen. This land, which was contiguous with the pleasure-ground, afforded room for a collection of plants of the pine tribe, and for the erection of the Palm-stove, which was built in 1848, and for the lake in its modern form—an addition

of forty-seven acres. In 1846-7 the Royal Kitchen and Forcing Grounds were incorporated with the Botanical Gardens, making an additional seventy-five acres in all. In 1861 Decimus Burton commenced the building of the Temperate-house, which lies in the avenue terminated by the old Pagoda. The Arboretum, or pleasure-grounds, were, after the death of the late King of Hanover, thrown open to the public. These grounds, which the non-scientific public greatly esteem on account of the beautiful timber they contain, comprise an additional 270 acres, and, in addition to this, the old Royal Deer Park, of about 400 acres, now belongs to the Woods and Forests Department, affording almost unlimited space for the extension of the Gardens when more space is required. These beautiful enclosures have, in short, grown up piece by piece, like the British Constitution, by grants and arrangements with the Crown, and they now form the finest horticultural establishment in the world, without cavil or dispute. It is needless to say that to give a full account of the Gardens in a botanical sense would occupy volumes. As, however, we are writing for the intelligent visitor, and not for the professional botanist, we shall probably satisfy him by pointing out the main features worthy of attention in the Garden and its museums.

The public are more familiar with the entrance from the Green, than with any of the other entrances from

the Richmond Road, or from the towing-path facing the Brentford and Isleworth ferries. The fine old gateway, a specimen of ironwork but rarely met with, seems to smile upon the holiday folks who, hot from toiling over the Kew Bridge, built after the Chinese ideas of such a structure, are gratified both in eye and mind by the luxuriant verdure that meets their eye immediately they pass these portals. It is no spick-and-span new garden they look upon ; the turf speaks of ages of careful culture, the trees rise to a noble altitude, and their foliage strikes them as something rare and beautiful. And well it may ; for the spot immediately within view is the old Arboretum. Here for two hundred years at least all the rare trees of the old and new world have been collected and carefully tended. The buildings, too, wear an air of picturesque beauty which speaks of the past. The old Kew Palace, somewhat retired on the right-hand, speaks of the days when solid building in fine red brick, which harmonised so well with the verdure around, was a living fashion. It seems, like all the old buildings of that age, to have a history, and that history, as we know, was associated with the latter years of the poor blind old king, which were spent within its walls. At that time the grounds around the palace were not nearly so open as they are now, the paths wound about amid shrubs ; and here, on one occasion, as Fanny Burney tells us in her autobiography, the poor

king, escaping from his keepers, pursued her, as she fled terrified through the garden to escape him. Here, also, Queen Charlotte lived many years after his decease, and closed her days. But scientifically as well as socially this spot is famous. Looking over the wire fence which separates the royal grounds from the garden—for they still belong to the Crown—we see a sundial mounted on an antique pedestal. This site marks one of the great astronomical triumphs of the past. The curious spectator may not have an opportunity of reading the inscription which is engraved upon it, which we therefore give.

“On this spot, in 1725, the Rev. James Bradley made the first observations which led to his two great discoveries—the aberration of light, and the nutation of the earth’s axis. The telescope he used had been erected by Samuel Molyneux, Esq., in a house which afterwards became a Royal residence, and was taken down in 1803. To perpetuate the memory of so important a station, this dial was placed on it in 1832 by command of His Most Gracious Majesty King William the Fourth.”

Thus by a most happy coincidence this ground may be considered sacred to the great explorers of the skies and the earth—the one a searcher of the starry heavens, the other, of the rarities of mother earth; and in the names of Bradley, the Astronomer Royal, and Sir William Hooker, the creator, so to speak, of these Gardens in a scientific sense, may be traced the origin of the two scientific establishments, the Kew Gardens and the Kew Observatory.

But to turn once more to the cool shade of the noble trees which tempt the lounge, scientific or otherwise, in these delightful gardens. As we have said, many of them are now in their prime, and all are more or less rare as well as beautiful. Very many of them are exotic, and were removed here by the Duke of Argyle, termed by Horace Walpole 'the tree-monger,' from his famous garden at Whitton near Hounslow. Among the most umbrageous of these trees we may note the Turkey or Mossy Cupped oak of South Europe and Asia Minor. The noble spreading branches of this tree always attract the visitor, and around the Cork oak, near at hand, it has been found necessary to put up an iron fence to keep off visitors, the tree having been nearly destroyed by the anxiety of the curious to take away trophies of its living bark. On the lawn near the pathway leading to the Herbageous Grounds may be seen a weeping willow that possesses an historic interest, inasmuch as it is grown from a cutting taken from the tree growing over the grave in which the Emperor Napoleon was buried at St. Helena. We perceive in Museum No. 1 a portion of the oak-tree under which the great Duke stood and gave his orders at Waterloo; a seat should be made of this, in order that the visitor may, at his ease, contemplate the relic of the great Emperor. Near at hand is a very curious tree, the Hop Hornbeam, so called on account of the blossoms resembling those of the hop.

The black walnut of the United States, and the common walnut grow side by side. Near the old Orangery, which stands with such a commanding presence, an example of the large manner of its constructor, Sir William Chambers, even in small things, are some noble specimens of oaks, one specimen of which, the Evergreen, or Holm Oak of Southern Europe, should not be overlooked. The tints of some of these trees are lovely in the autumn, and make us regret that the old habit of planting them in our parks has completely gone out. There is a fashion in trees and tree-planting as in most other things. For these last fifty years the deciduous trees, which make autumn so glorious in the parks of Old England, have given way to trees of the evergreen kind, to such an extent that they are now scarcely procurable in the nurseries of this country. Thus, when it was determined lately to plant some of the vistas radiating from the Great Palm-house with the rarer specimens of hardy deciduous trees, it was found necessary to procure them from foreign nurseries! The last popular fashion is for the Deodar Cedar, which is clothing the pleasure-grounds of England with its beautiful drooping foliage. The *Araucaria imbricata*, or the Puzzle Monkey as it is popularly called, is another conifer that is making a steady footing in our pleasure-grounds, but it is only lately that it has been spread about largely by the nurserymen. In the old Arboretum, through which

we are still strolling with the reader, is a specimen, which was planted as long ago as 1792. When Sir William Hooker was first appointed Director of the Gardens he found this tree sheltered by a small hut-like structure, the supposition being that it was only half-hardy and could not withstand the rigour of our winters. We may notice here, by the way, that this testing of plants as regards their powers of becoming thoroughly acclimatised, is one of the most important functions of the establishment. Associated as this botanical establishment is with kindred institutions in our colonies throughout the globe, of which, indeed, it is the nursing mother, it follows that plants and seeds are constantly arriving the very nature and habits of which are as yet unknown; but they are here tested, and if found suitable to our climate, are spread throughout the land through the agency of the nurserymen. By this means enormous sums of money have been thrown into their hands, some single plants having sufficed to make the fortunes of some of the leading firms; but, as we shall show, they have returned the favour with interest.

Notwithstanding our desire to see the old fashion revived of planting deciduous trees in preference to the unchangeable evergreens, we cannot help regretting there are so few Cedars of Lebanon in these Gardens. These trees were a fashion of our ancestors. They are said to have been introduced to this country

by Evelyn in 1691. This being true, it disposes of very many pretty tales connected with this majestic tree. For instance, it is fondly repeated by many a pleasure-party that floats past the Duke of Northumberland's grounds at Sion House, on the other side of the Thames, that Lady Jane Grey received notice of her accession to the crown whilst sitting under one of the fine cedars in these grounds. Be that as it may, however, there can be little doubt that the Cedar of Lebanon gives an expression of grand repose to a garden which we fail to find in any other tree. How much do some of our old hereditary houses owe to their solemn grandeur—a type of the persistent historic life of their possessors? Of old there stood a fine avenue of these noble cedars in this Arboretum. They were planted about the year 1700. Of these, there only now remains a fine old stump covered with ivy. It is very much to be regretted that as they decayed, some younger cedars were not replanted. There are many very exaggerated ideas afloat relative to their slow growth. The size of many existing trees which cannot be two hundred years old, if it be really true that Evelyn first introduced them, testifying to the contrary.

But the rare trees we have mentioned are not confined to the small space which formed the old Arboretum, and covered only five acres. The adjacent lawns are also planted with them, some of which have an

unmistakable foreign appearance. For instance, the visitor is immediately struck by the appearance of the United States palm and the Chusan palm, comparatively low trees, which meet his view immediately he enters the garden. The Oriental appearance of these makes him for a moment believe that he is in an Eastern palace. A very slight protection is all that is required for them in the winter. Near to these singular trees the *Yucca gloriosa* sends up its tall spire of white flowers; they are nearly allied to the Aloes, and the visitor for a moment thinks that he has had the good fortune to see that plant in blossom, which, however, he may have done this very summer by visiting Stovehouse No. 5, where the so-called Century Palm was in bloom for the first time in this country.

But what is that delicious scent that is wafted to us as we advance? The *Magnolia grandiflora*, with its pure white blossoms scattered amid the grand foliage of the beautiful tree, at once strikes the eye with its beauty, and answers the question. We may wander for hours amid these fine trees without tiring ourselves; but as we hear the Great Lily is just out, let us make our way to the T-shaped stove-house, which is close at hand. What a delicious scent greets us as we enter! and what a glorious sight this peerless lily presents, seated amid her green island-like leaves! Well may the famous botanist Haenke have fallen upon his knees when he discovered it, and expressed his sense

of the power and magnificence of the Creator in his works. But grand as the plant is, in this humid stove, under the tropic sun and in the noble waters of the Amazon, it appears to this one as a giant to a pigmy. There the flower is upwards of a foot in diameter, and the leaves measure as much as eight feet across, and are capable of bearing half a hundred-weight. But comparatively dwarfed as it appears under artificial treatment, it is still surprising. The study of the evolution of leaf and flower for a day or two is most interesting. The bud, which makes its appearance from beneath the water in a few hours, as rapidly opens when it is clear of it. The bursting of the bud is accompanied by a slight noise, and immediately the house is flooded with a delicious perfume, somewhat like that of the magnolia, only more delicate. As you watch the petals slowly unfold, at first the flower appears of a creamy white; but ere long, as its cup-like form fully opens, the most delicate pink is seen to tinge them; but the bloom lasts only for a short time, as they perish the day of their birth, and new blooms come up and repeat the glory. But the evolution of the leaves is scarcely less interesting, if not quite so beautiful. They first appear on the surface of the water curled up, with their deep mid-ribs strongly marked, and here and there armed with long thorn-like spikes. Coiled up like a hedgehog they first make their appearance in this world; on

their putting off their defensive attitude, they slowly unfold their beauty to the sky ; appearing at first with a deep rim, which doubtless induced the natives to call them 'water platters ;' and so they unfold, until at last the circular leaf lies flat upon the silver flood, an emblem of perfect repose, moored by its rope-like stem to the central root. Let us hope that a larger tank may be afforded to this beauty to display her ample setting of emerald leaves. As it is, they crowd up and over the stone margin of their tank, and give the spectator a sense of the plant being crushed and crowded. But we must not, even by the grandeur of the *Victoria regia*, be prevented from noticing the extreme beauty of the *under* side of the leaves of another lily close at hand—*Euryale ferox*. These leaves are not nearly so large as those of the *Victoria* lily ; but either by accident or by design one of them was twisted upon its stalk, so as to show its under side—a perfect marvel of colour. The leaf itself is like a piece of reddish-purple satin, whilst the prominent midribs are a rich amber. It seems a pity that such a beautiful sight should only meet the human eye by accident.

Not far from this tank the curious may note several varieties of the pitcher-plant. The bottom of the deep pitchers, which are suspended from this singular tree, is generally filled with water ; and as the inside edge of the pitcher is frilled round with a series of

fine hairs pointing downward, it would seem as though Nature intended it as first a lure to attract insects, and then as a trap to hold them, as they do not appear to be able to surmount the fringe of hairs which prevents their exit. The pitchers are therefore full of drowned insects. Some of these receptacles hold two quarts of water, and, notwithstanding the flies, the draught is sought for by the thirsty traveller with avidity. Near this plant is another—*Nepa frusticans*—a low stemless palm, bearing a large head of nuts, that grows in the tidal waters of the Indian Ocean. Dr. Hooker tells us in his Himalayan Journal that there is a particular interest attaching to this plant in a geological sense, inasmuch as the nuts of a similar plant have been found abounding in the tertiary formations at the mouth of the Thames; and must have floated about there in great profusion till buried deep in the salt and sand that now form the island of Sheppey. Young palms of different species fill up the surrounding benches, and on the western wall the *Vanilla planifolia* is trained, yielding the famous flavouring fruit. The houses forming the two arms of this stove-house are devoted to economic plants, both tropical and temperate. Of the growth of fruits and condiments we daily eat, how few of us have any knowledge; of the fibres that yield us garments, not one in a hundred is as familiar as it ought to be. Here we may find the coffee-tree grow, the cotton-plant bearing the cotton-

pods, the clove-tree, the ginger-plant, the India-rubber-tree, the nutmeg-tree, and a score of others that we have not space to mention. The teaching power of these stove-houses is far beyond anything the public can gain from books, because here they have the facts printed, as it were, direct from Nature upon the inquiring brain, in a manner which is pleasant and rarely forgotten. Here and there Nature in her economy gives us products that are almost humorous in their character. Let us note, for instance, the sack-tree. By merely soaking and beating its trunk, the bark is sufficiently loosened to turn inside out, a section of the bark being left at the end to form the bottom of the sack. In the museum at the end of the Herbaceous Garden the visitor will see one of these sacks. This is an example of the application of these museums in giving to the public a view of the ultimate use of these economic trees.

In the northern wing of this cruciform house the visitor should not forget to see the (Venus Flytrap) *Dionæa muscipula*, another enigma of Nature. The irritability of the lobes of the fringed blades of the leaf is so great that, upon an insect alighting upon them and touching any of the minute bristles upon the surfaces, they close upon it like a pair of sugar-tongs and imprison it—who shall say for what ultimate purpose this automatic engine of destruction was devised?

Striking northward towards the Palm-stove which gleams in the sun, let us take in our way the Water-lily house, or tropical aquarium. The small tank in this house is mainly occupied by the papyrus, the first paper-making material of which we have any knowledge. The flowering stems contain a pith which is cut into strips with their margins overlapping; these strips are crossed by others at right angles, and by means of pressure are consolidated into the writing paper of the ancients. It seems strange that after so many thousand years we should have come back to a similar material for the manufacture of paper. Esparto grass now forms the broadsheet of many London daily papers. Common straw is also largely used, and the woody fibre of the Norway pine is now making its way into the market for the same manufacture. Among the graceful papyrus, float several beautiful species of water-lilies, the most interesting of which is the *Nymphaea gigantea*, an Australian lily whose flowers, of a most delicate blue, measure twelve inches across. Some of the lotus tribe have red and white blossoms. A very curious plant to be seen in a tub in this house is the water-lettuce of tropical countries, in which only the skeleton appears. The triangular tanks at the corners of the house are filled with the Sacred Lotus of the early Egyptians, and which is so often found delineated on their monuments. The graceful appearance of this plant immediately strikes

the attention, independently of its interesting associations with the past. We can liken the setting on of its leaves to nothing more nearly than to that of the Nasturtium, only their colour is of a more tender green, whilst the flower is a most delicate pink, with seed-pods like a top, in the flat upper surface of which the seeds are set separately at equal distances. No more graceful plant could find a place in private tropical aquariums than the Sacred Lotus. Near at hand is the very remarkable Telegraph Plant of India, so called from the spontaneous jerking motion of the lateral leaflets, which are alternately raised and depressed. This is one of the curiosities of the Gardens, and seems to hold the visitors with a sort of mesmeric attraction. The Caricature Plant is close at hand. The variegation of the colour on its leaves often assumes very curious forms, hence its name; but we confess that we have rarely seen any irregularity which could be said to take the character of a caricature. But from these frivolities of Nature, so to speak, the eye is irresistibly attracted by the lovely colour of the common rice plant, the great food-producer of the teeming millions of Asia, India, and the Southern States of America. From the small seed-plots we see flourishing here, of the colour of the heart of a lettuce, we can imagine the delicious repose vast swamps of it must give to the eye in the torrid East and on the parched plains of the South.

It is but a step to what seems to the public the central sun of the gardens—the Palm-stove. This is, we believe, the largest tropical house in existence, its entire length being 362 feet by 100 feet in width, and 66 feet in height. What a noble prison-house it is for the captured forest trees of the tropics, and how healthy and luxuriant the captives look! The visitor is transported to the torrid zone, and finds the blaze of light shadowed by the curved leaves of the palms, which make dim arcades of shade as he pushes through them, whilst the humid heat helps to carry out the deception; only one thing seems wanting—a few bright-coloured birds to make the picture perfect. But we forget: mere illusions, however delightful, are not sought after here, but facts, and they are sufficiently pleasant and enticing to need no adventitious help. Graceful as is the foliage of these palms, they may be termed economic plants in the highest degree, as many of them provide food and wine, water, clothing, and cordage to the inhabitants of the arid country in which they grow. In many cases, indeed, they may be said to be the tree of life, affording at once shelter, food, and drink to those who seek them. Visitors who enter these houses to seek information will find each plant duly labelled, so that they have no difficulty in ascertaining their names and the class and order to which they belong. They may, therefore, be considered living picture-books. Indeed, this may be

said of the whole garden, from the meanest weed that grows in the Herbaceous grounds to the noblest trees; and, in this sense, the value of it as a public instructor is inestimable, and the more so that the knowledge they afford is given insensibly, whilst indeed the loungee thinks he is merely enjoying himself. Among such a tangled mass of verdure we have only space or time to refer to a few of the more graceful or valuable in an economic sense; and in doing so we cannot avoid availing ourselves of the valuable and interesting guides to these gardens by Daniel Oliver, Esq., the keeper of the Herbarium. They are models of what such guides should be, clear in description, full of facts, and without one superfluous word.

*Arenga saccharifera*, as its name implies, is a palm yielding abundant saccharine matter, which by fermentation makes an excellent wine—red and white—each tree yielding on an average three quarts daily. Marco Polo says, “When they want wine, they cut a branch of this, and attach a quart pot to the stem of the tree, at the place where the branch was cut; in a day and a night they will find the pot filled.” Its fibrous integument makes incorruptible cordage, and the cellular pith of the trunk affords abundant sago-meal. Close beside this wine-and-meal-giving tree is a Brazilian palm—*Astrocaryum rostratum*. The sight of this tree of ferocious habit reminds one of the fierce tiger that lies in wait amid the verdure of tropic

climes. Every leaf is beset with powerful spines, which mark the midribs of the leaves, and are arranged in rings around the stem. Any traveller making his way in the forest would certainly feel the force of these talon-like projections, which justify its classification among the ferocious genus. *Carycta urens*, another palm, is a native of India, remarkable for its divided leaves and wedge-shaped leaflets. This is another wine-giving tree. It would seem as though Nature in very hot climes compensated mankind for the extreme heat by affording natural fountains of refreshment to the inhabitants. Roxburgh in his 'Flora Indica' says, "This tree is highly valuable to the natives of the countries where it grows in plenty. It yields them during the hot season an immense quantity of toddy or palm wine. I have been informed that the best trees will yield at the rate of a hundred pints in the twenty-four hours. The pith, or farinaceous part of the trunk of old trees, is said to be equal to the best sago; the natives make it into bread and boil it into gruel." Thus bread and wine may be said to be the fruit of this beautiful palm. We cannot fail to recognise the tall and beautiful cocoa-nut-tree (*Cocos nucifera*), which lifts its head crowned with graceful plumes above the other trees. This palm, which is universal in tropical countries, perhaps yields a more varied produce to mankind than any other tree; indeed, it is popularly said that its uses are as

numerous as the days of the year. The gigantic leaves of the Talipot Palm of Ceylon and the Indian Archipelago, which casts such a shade, naturally suggested one of its principal uses—the construction of tents. The West Indian fan-palm (*Sabal umbraculifera*) is another specimen of the broad-leaved class of palm, the leaves measuring from four to six feet in diameter, and growing to a height of sixty to eighty feet; in this stove it is comparatively short, but the breadth of foliage contrasts richly with the more plume-like class of leaves. A very beautiful palm is *Phytelephas macrocarpa*—the Vegetable Ivory Palm. The peculiarity of this palm is that the stem, instead of being erect, trails along the ground, sometimes for twenty feet, before it begins to rise, and then it lifts its head barely more than three or four feet. The seeds which produce the vegetable ivory are found in hard clustered capsules. This ivory is used for turning purposes, the cheaper kinds of chessmen being made from it. The beautiful fan-like arrangement of *Urania speciosa*, the Travellers' Tree of Madagascar, draws attention to one of the most valuable trees of the tropics—a tree yielding pure water. Ellis in his 'Madagascar' tells us—

“This tree has been most celebrated for containing, even during the most arid season, a large quantity of pure fresh water, supplying to the traveller the place of wells in the desert. Having formerly been somewhat sceptical on this point, I determined to examine some of the trees. One of my bearers struck a spear four or five inches deep

into the thick firm end of the stalk of the leaf, about six inches above its juncture with the trunk, and, on drawing it back, a stream of pure clear water gushed out, about a quart of which we caught in a pitcher, and all drank of it on the spot. It was cool, clear, and perfectly sweet."

We are not aware whether in the Palm-stove this water, which to the thirsty traveller must seem like a direct gift from God, is yielded; if so, and the tree was not injured by it, a trial now and then before the public would be deeply interesting. At each end of the stove there are staircases, which lead to and from the gallery, from which a view of the heads of the palm-trees is obtained. Near the ascent staircase is a very remarkable group of Screw-pines, so called from the likeness of their leaves to that of the pine-apple. The great peculiarity of these palms is the manner in which they throw out adventitious roots above ground, which serve as buttress-like supports to the tree. The *Bambusa vulgaris*, close to the staircase, is a specimen of the rapidity of growth of this cane, which, like the *Bambusa gigantea*, is rapidly reaching the glass roof. It has been observed to grow at the rate of eighteen inches per diem; and this very specimen has reached to the gallery from the ground in three months! The uses of the Bamboo are almost too numerous to mention; and in the Museum No. 2, at the end of the ornamental water, opposite this building, hundreds of specimens of articles manufactured from it may be observed. Among the smaller speci-

mens in this house, the magnificent *Doryanthes excelsa*, an Australian lily, which, like the country of its birth, is on a magnificent scale, throws up flowering stems of twenty feet in height, having clusters of crimson flowers twelve to eighteen inches in diameter. Let us notice also *Girardiana Leschenaultiana*. This is a most virulent Indian nettle. The late Curator of the Gardens was stung by it on one occasion, when his hand swelled to double its normal size, and he was disabled for at least a couple of hours, when the inflammation gradually subsided. Before ascending the staircase, we must not forget to notice *A. toxicaria*—the deadly Upas tree. Dr. Horsefield says,—

“This is one of the largest in the forests of Java; the stem is cylindrical and perpendicular, rising completely naked to the height of sixty, seventy, or eighty feet. Close to the ground the bark is, in old trees, more than an inch thick, and upon being wounded, yields plentifully the milky juice, from which the celebrated poison is prepared. In clearing new grounds near the tree, the inhabitants do not like to approach it, as they dread the cutaneous eruption which it is known to produce when newly cut down. But except when the trunk is extensively wounded, or when it is felled, by which a large portion of the juice is disengaged, the effluvium of which mixing with the atmosphere, affects the persons exposed to it with the symptoms just mentioned, the tree may be approached and ascended like the common trees of the forest.”

Thus it will be seen that the popular notion as to the deadly shade of the Upas tree, which the poets make so much of, is by no means to be taken as literally true. As long as its stem remains intact indeed, it

appears to be harmless; it is only the juice which contaminates the air with poison. Ascending the spiral iron staircase, we have a full view of the crowns of the palm-trees, and the manner of their being thrown off from the main stem. The unfolding of some of the leaves may be observed, showing the tender green of that portion of them which has just seen the light. Some of the creepers which ascend the staircase and surround the gallery show the prolific nature of these plants; and some of the flowers are magnificent in colour. High, however, as we have ascended, it will be seen that the tropical trees have shot still upwards, and the flora of the warm latitudes is threatening to touch the glass roof. Since the introduction of glass as a protection against the weather, there has been a struggle to lift it high enough to keep pace with tropical growths. Like the contest between guns and armour-plating, there has been an incessant struggle between Art and Nature in the stove-houses. At first the old Orangery was employed to preserve the plants and trees requiring heat, but the palms and pines speedily shot up to its comparatively-speaking low roof, and had to be cut down to suit the capabilities of the house. Decimus Burton lifted this roof to sixty-six feet; but we now see the bamboos lifting up their verdure to the glass, and some of the palms will shortly touch it, and then—but here the contest is ended by the triumph of the

trees. It may be asked, why may not the glass roof be made to lift so as to accommodate these tropic growths? This, no doubt, would be easy of accomplishment by means of telescopic columns that could be lifted by machinery; but when we remember that some of the trees now in this Palm-house acquire an ordinary height of from 100 to 180 feet, we fear the victory must be left with Nature and the flora, inasmuch as lifting the roof to anything like this height would involve difficulties in sending heat to such altitudes. Such, at least, is the present view; possibly a few years may enlarge our ideas and our capacity for action in the matter, as it has in so many other cases. Meantime, we must submit to see the glorious leaders of the palms cut down and their beauty spoilt, or, when they are at their greatest beauty, they must be removed from the house and destroyed, in order to give place to younger trees, which, in their turn, will be nursed at great expense to full treehood to be in like manner degraded—a result, we must confess, greatly to be deplored, and most of all by the learned Director of the garden, who of all men must most regret to see a limit put by Art to the vigorous powers of nature, which his skill has done so much to foster in these gardens.

If we leave the Palm-house by the middle door looking towards the *Sion Vista* or northwards, we see, radiating west and east of us, two others; the vista

leading past the Temperate-house towards Sir William Chambers's pagoda, and the so-called *Cedar Vista*. These long avenues are not yet completed, but it is sufficient to say that they are lined with deodars and with deciduous trees, those of the old world facing as a rule those of the new. The *Sion Vista* right before us was cut so wide that it admits a torrent of cold air from the north, and the deodars that were planted here, for this reason or from the poverty of the soil, have failed to make any growth. If we follow the *Pagoda Vista* a few hundred yards we come into the pleasure-ground or new Arboretum, in which the new Temperate-house is situated. This building was built after a design by Decimus Burton in 1861. The building consists of a centre 212 feet long by 137 broad. There are two octagons 50 feet in diameter, which it is intended to connect with the main building by terminal wings, but as yet the plan is not completed. The glass is tinted a light green by oxide of copper, in order to intercept some of the heat-giving rays of the sun. This arrangement is also adopted in the Palm-stove.

The planting of this house so far away from the more cultivated part of the garden is appropriate to the flora it contains, dedicated as it is mainly to Australian Forest Trees, and other countries in the far distant South Pacific Ocean. If we ascend the staircase and look down upon the vegetation, we see at a

glance the distinctive nature of the Australian flora, so different from the vivid verdure of the tropics, or the deep green of the vegetation of the northern latitudes, where Nature, clothed in her dark pine forests, seems to be in solemn mourning. The flora of Australia, to begin with, is remarkably uniform in its character. The gum trees, including the iron, and stringy-bark trees, and the blue, white, swamp, and other gums, have all a uniform complexion. We are told that the Acacias have a remarkable peculiarity in their leaves also, which aids in making them colourless. "The compound, and often greatly divided blade of which usually remains undeveloped, so that the leaf is reduced to a stalk, which, however, to compensate for the want of the blade, is so much flattened as to resemble an ordinary leaf. These flattened leaf-stalks (*phyllodia*) may be recognised as such by their vertical direction, being attached as it were *edgeways to the stem*." Near the staircase, an excellent example of this curious character of the leaf, and the method of its setting on, may be observed in the *Acacia melanoxyton*. It can easily be conceived that the vertical position of the leaves to the stem, different from the horizontal arrangement so common in trees, goes a great way to produce the shadowless aspect of the flora in Australian woods, which Darwin thus notices in his 'Voyage of the Beagle':—

"The extreme uniformity of the vegetation is the most remarkable

feature in the landscape of the greater part of New South Wales. Everywhere we have an open woodland, the ground being partially covered with a very thin pasture, with little appearance of verdure. The trees nearly all belong to one family, and mostly have their leaves placed in a vertical instead of, as in Europe, in an horizontal position. The foliage is scanty, and of a peculiar pale green tint, without any gloss. Hence the woods appear lightless and shadowless."

One of the blue gum trees of Australia has been planted out at Kew, near the house, and is flourishing. We question, however, whether it will stand the severity of an English winter. But in the south of France, and more especially in Portugal, these *Eucalypti* have been introduced and cultivated with extraordinary success. We have seen as many as two hundred varieties of them in the Botanic Garden at Coimbra, and the importation of this tree is a national benefit to the Peninsula. It grows very fast even in a dry and hungry soil; it affords excellent timber; it acts as a disinfectant for unwholesome places; the bark contains an alkaloid febrifuge; the leaves may be smoked; and its uses appear to be innumerable.

Interspersed with these shadowless trees we have mentioned there are many, however, in this house growing in the same temperate zone of a totally different character. Let us note, for example, *Araucaria Bedwelli*—the Bunga Bunga Pine. This is really a beautiful tree, with dark green glossy leaves, growing to from 100 to 150 feet high, and producing large cones, the seeds of which are eaten by the aborigines

of Moreton Bay, Australia. This pine flowered for the first time in Europe in this house the year before last, and the cone may be seen in No. 1 Museum, at the bottom of the ornamental water by the Palm-house. It is said that these trees form the only hereditary property which any of the aborigines are known to hold; each tribe possessing its own group of trees which pass on from generation to generation.

Another very remarkable tree which springs up amid the dingier gums, and is just touching the roof, is the Norfolk Island Pine, the leaves of which forming green platter-like trays, so to speak, at regular intervals on its delicate stem, have a very graceful effect. In its native woods it reaches a height of 200 feet. These beautiful trees have been successfully imported into Europe, and grow with great luxuriance at San Lucar and on the coast of Portugal. New Zealand has many specimens of her trees at Kew; among them, *Kai Katea*, a fine tree—the white pine of the colonists, and *Areca sapida*, a New Zealand palm, and *Podocarpus Totarce*, which is one of the most valuable timber trees in the colony.

On the northern side of the house there is a noble collection of Japanese plants. That country we are told is characterised by an unusually large proportion of woody plants, many of which belong to families which are rare elsewhere so far to the north. This doubtless is the scientific distinguishing character of the Japanese

flora, but to the non-botanical observer the remarkable characteristic is the perseverance with which this extraordinary people have managed to variegate the leaves of their plants. The *Aucuba Japonica* we have so assimilated to ourselves, is a specimen. The variation in the leaves of this handsome laurel is but a type of the change effected in numerous other plants by the Japanese,—a testimony to the civilisation which must so long have existed there, in order to bring about this remarkable result. In consequence of our hitherto having had but one sex of the *Aucuba*, it was long wanting in the beautiful scarlet berries, which contain its seed, but this deficiency has of late years been supplied, and the staminate plant can now easily be procured. As the climate of Japan closely resembles that of Great Britain, most of the Japanese plants can be grown in this country without protection.

A very short walk from the Temperate-house takes us to the Chinese “Tai.” This pagoda was built under the direction of Sir William Chambers in 1761–2, and was considered at the time one of the finest specimens of brickwork in the country. It consists of ten octagonal stories, which diminish from the lowest. The building is 163 feet in height, and the view from the top is very beautiful, extending over a large area of country. It is closed to the public in consequence of the inveterate habit of name-cutting which affects a

certain class of visitors. The only Cedars of Lebanon of any size in the garden are close to the building; they were planted in 1750, and consequently are fine trees.

Now that we are in the Arboretum, or pleasure-ground, which the public so much affect, it will be as well to give some account of it. It was mainly planted about the year 1730 by the Earl of Bute, consequently the trees have grown to a noble size; but the wood has altogether lost its character within these last fifty years—indeed since the destruction of old London Bridge. The old Curator, who still survives, tells us that in his youth the Thames stood at least three feet higher than it does now; in fact, there was never low water showing mud banks such as we now see. The solid piles of the old bridge formed an impediment to the flow of the stream, which kept it back like a mill-dam—a fact which those old enough to have performed the perilous feat of “shooting the bridge,” as it was called, can well remember. The effect of lowering the tide, no doubt seconded by the general land drainage of the neighbouring country, was that very many of the trees died; the present Curator testifies to the fact that when their roots have been dug up, they were marked at a certain depth, where the water never reached them in the gravelly soil, by a fungus which destroyed them. There used to be a tangled underwood throughout, and rare

mosses and ferns grew there, which collectors in despair can no longer find. In fact, it was at one time a covert for game, impassable to any one but the royal beaters. When the Queen made over the Botanical Garden and the old Arboretum to the public, the pleasure-ground was in the possession of the late King of Hanover, and this prince refused to give up possession, but kept it as a preserve for pheasants. At the annual shooting the game was sent over to Hanover, and we are informed found its way back again to this country as presents to his friends! Even as late as the advent of Dr. Hooker, the present Director, it was impossible, he tells us, to find a way through the dense undergrowths; the squirrels and the wild birds were plentiful, and the aspect of the place was quite forest-like. Since that time it has been brought within the pale of civilisation. The undergrowth has disappeared, paths have been cut through in every direction, new trees have been planted, and it has assumed its true form as a noble pleasure-ground. The river, it is true, has become very tidal, and the banks at time of low water muddy; but the side of these grounds overlooking the Thames is still the favourite resort of the mere pleasure-lounger in the Gardens.

Finding our way back from the pleasure-ground by way of the gate near the Temple of Minden—a monument to a battle Englishmen have almost forgotten—

we come in sight of the flag-staff, said to be the finest spar in Europe ; it is planted in a mound to a depth of eighteen feet, and its entire length is 159 feet. But the height is but that of a clothes-prop to some of the spars the *Wellingtonia gigantea* trees could yield. A specimen of this tree is to be found in the plantation on the round mound near the Palm-stove of a very moderate height ; but in California there are trees now standing 450 feet in height and 116 feet in circumference ! The fine square tower we pass on our right once did double duty as a smoke-shaft, drawing the smoke from the Palm-stove furnaces, and as a water-tower, in order to obtain a sufficient elevation for the requirements of the gardens and houses. But both these requirements have now been answered in another manner ; the smoke takes a short cut through the two wings of the building, and the water is now provided by means of the lake in the pleasure-grounds, from which it is pumped by an engine near the Temperate-house to tanks in Richmond Park. Formerly the smoke from the Palm-stove was conveyed by underground flues a distance of nearly 500 feet to the tower, where it was consumed. An underground railway also ran to the stove, to convey coals to the furnace and remove the ashes.

A short winding path takes us to the Herbaceous Grounds, which form one of the most interesting features in the Gardens, and answer many questions

plant-growers feel interested in, but which the uneducated passer-by thinks as of no account. These herbaceous grounds may be looked upon as the living reflex of the Herbarium, to which we shall draw attention presently. It may be considered a map of hardy herbaceous plants, arranged in the natural orders to which they belong. The botanical nature of the plants are arranged according to their affinity, as determined by the structure of their flowers and organs of reproduction.

Some of the orders occupy several beds, and some but few, the order in many instances being represented by a typical plant placed in a circular side-bed, so that the botanist sees at a glance the bed from which he may require to gather information. The grasses and sedges are illustrated by a splendid collection. The thistle tribe—few people sufficiently appreciate their beauty—are very numerous, culminating in the artichoke, which we have often wondered has not been introduced into our flower gardens for the beauty of its foliage. Evelyn tells us that they were appreciated by the ancients as they deserved. “For not very long since this noble thistle came out of Italy, improved to this magnitude by culture, and so rare in England that they are commonly sold for a crown apiece; but what Carthage yearly spent in them, as Pliny computes the sum, amounted to £30,000 sterling.” Whether they were appreciated for their

beauty, or for their gastronomic properties, Evelyn does not say ; but the nobility of their appearance no lover of the beautiful can deny. The infinite varieties of many of the common flowers, only the botanist has a notion of, the differences in many cases only being observable to the keen scientific eye. Nevertheless, only distinct types are represented here, all cross-breeds being eliminated. Among the noble foliage to be found here we took especial note of the *Gunnera scabra*—a plant which grows very like the rhubarb, the leaf-stalks springing at once from the ground, but flowering differently, the seed-pods springing also from the ground. The leaves are of gigantic proportions, measuring eight feet in length, and forming deep masses of shade, and presenting most striking forms. We trust we shall see it ere long embellishing private gardens. A collection of hardy ferns, Alpine plants, etc., close to the Herbaceous Gardens, clearly attracts many fanciers, as we see they are under the especial care of a watchman, rare ferns being one of the articles some people see no crime in appropriating clandestinely.

Of the value of this herbaceous garden, as a test by means of which collectors are able to identify rare plants, the number of persons who daily visit it is the best proof. It may be asked, what's in a name, "a rose by any other name would smell as sweet?" but the nurserymen know otherwise, and in order to sell

their plants they must give the true botanical name. This garden, and the Hortus Siccus, or Herbarium, by far the most extensive collection of dried plants in existence, form a necessary complement to each other. The house at the entrance of the Gardens where the late King of Hanover used to live, forms what may be termed a huge album, where most of the dried plants in existence can be found duly indexed and arranged in folios. In this and the herbaceous grounds most of the scientific work of the Garden is done. The valuable Botanical Library situated under the same roof attracts to it botanists from all quarters of the globe, and nearly every valuable work on the subject published in this country has issued from this spot.

Having made the tour of the grounds and the conservatories, it only remains for us to direct attention to the Museums of Economic Botany, of which there are three. To use the words of Professor Oliver's Handbook,

"We learn from them the sources of the innumerable products of the vegetable kingdom for our use and convenience, whether as articles of food, of construction and application of the arts, of medicine, or curiosity. They suggest new channels for our industry; they show us the variety in form and structure presented by plants, and are a means of direct instruction in most important branches of useful knowledge. We see from them the particular points upon which further information is needed, especially as to the origin of some valuable timbers, fibres, and drugs, in order to perfect our knowledge of economic botany; in brief, the Museums tell us *how little* as well as *how much* we know of the extent of which herbs, shrubs, and trees contribute to our necessities, comforts, and numberless requirements."

Crowded as these Museums are with curious vegetable productions from roof to floor, we can only notice the more striking and noteworthy of them. As we are nearest the Museum No. 3, which is in fact the old Orangery, to be seen immediately on the right-hand on entering the gates of the Gardens, let us proceed towards it. This Museum is chiefly devoted to a collection of specimens of Colonial timber mainly derived from the Exhibition of 1862. No approach to a scientific classification is attempted with these specimens, as in the other museums; in fact, many of them are only duplicates of those contained in the arranged collection, but on account of their magnitude were not capable of being included with them. One of the most striking objects which attracts the attention on entering the building is a bowl-like cup worthy to form a goblet for Neptune. It is the receptacle in which the root of the double cocoa-nut actually grows, in the form of a wooden bowl with a rough picturesque exterior perforated with holes through which the roots of the tree pass. The double cocoa-nuts themselves, which before their discovery on the Seychelles near Madagascar were found floating about in the Indian Ocean, were considered great rarities, and sold for enormous sums. Another very curious plant in a glass case is *Welwitschia mirabilis*. This plant is closely allied to the Pine family, and is certainly one of the most singular-looking products of the vegetable

kingdom. It consists of two leaves only, which lie flat upon the ground, extending each for six feet. These leaves are said to live the whole life of the plant for one hundred years, and become dried and torn to rags. The flower is a foot across. It was found growing in a hard stony soil in South-west Tropical Africa. Another most remarkable plant, or fungus, is close at hand modelled in wax, the *Rafflesia Arnoldi*, a parasite which grows upon the stem of some of the Vine order in Sumatra. The flower is the most gigantic in existence, measuring from three to six feet across. It has neither leaves nor stem, and may be considered a vegetable prodigy. The space in this museum is taken up with specimens of Colonial timber more interesting in a constructive point of view than any other; but we must not leave its doors without noting the very ingenious method of toy-turning, of which there are specimens sent from Saxony. It will be seen that the rough forms of different animals are first turned in a circular piece of wood, and from these segments are cut, and afterwards rounded so as to represent nature. We can, after seeing this rapid method of production, understand how it is that a whole menagerie in a Noah's Ark can be purchased for sixpence. To the archæologist the relic of Herne's Oak, blown down in Windsor Forest, and presented by the Queen, will prove interesting.

If we pass over westward we come to Museum

No. 1, which is situated at the bottom of the ornamental water facing the Palm-stove. This museum is devoted to flower-bearing plants. The examples are contained in cases in which the orders and families are duly noted on the outside. The orders are ranged in different floors. It would be tedious to dwell upon these specimens which, however, are highly instructive to the scientific inquirer. On the ground-floor are some very curious examples of the use of the different English woods, and under the Willow order are specimens of the ancient Exchequer tallies. Up to the year 1830 the accounts of the Exchequer were kept by means of these tallies, which were made of willow or poplar wood. The amount of money they represented was noted on them by means of notches cut in the side of the flat tally. These were easily split, and the counter-tally served as a check upon the original one. Such is the life in old customs in England, that were it not that the accidental firing of one of these bundles of tallies set fire to the old House of Commons, it is quite possible that the tally system might still have been in vogue. Among the curious examples of old oak, showing the power of this wood to resist change, may be mentioned a portion of a pile of old London Bridge, taken up in 1827, which must have been in use 650 years, and yet seems as sound as the day it was put down. Some of the bog oaks are also very curious; and a portion of the 'Maria Rose,'

lost at Spithead in the reign of Henry VIII., is still perfectly good.

Museum No. 2 is at the bottom of the Herbaceous Garden, and is appropriated to specimens of the products of those plants which are commonly regarded as not bearing flowers, such as mosses, ferns, seaweeds, lichens, and mushrooms. There are only two floors to this museum. In the rooms of the ground floor are many curious specimens which are interesting. Let us note ivory nuts from the Vegetable Ivory Palm, with specimens of chessmen and other ornaments cut out of the ivory. The method of carrying tea in Paraguay in the skin of the great ant-eater, specimens of wood stained green by *Peziza æruginosa*, and used for the manufacture of Tunbridge-ware. Here also we may see specimens of the gulf-weed which forms such immense masses in the eddy of the Atlantic, to the west of the Azores, as to offer impediments to the navigation of vessels.

It may be asked how Kew Garden has fulfilled the scheme of such a natural garden as was foreshadowed by the late Dr. Lindley; what imperial purposes has it served; what has it done towards proving itself a nursing mother to our Colonial possessions? This is a very important question, and we think the Director can with pride reply. From these Gardens have issued the *Cinchona* plants which are now clothing the hills of India, and from the produce of which quinine

is now largely manufactured in the Nilghiri mountains and in the Sikkim Himalaya. The importance of the introduction of this life-giving drug to the holders of India, and to all fever-stricken populations, cannot be exaggerated. The cultivation of ipecacuanha in the same country from seeds sent from Kew and under the care of Kew gardeners, is another fact which cannot be dwelt upon with too much pride by Dr. Hooker. It was made known as early as 1648 by the physician Piso that this powder was a cure for dysentery, but this knowledge seems to have been forgotten until the present time, when it was found to be really a specific for the disease when taken in large doses. The value of such a drug as this and the Cinchona bark to Europeans in the East is certainly incalculable; but the Director of Kew Gardens, with the large view he has taken of the true value of such a botanical centre as he directs, has made efforts to disseminate throughout our wide domains many other valuable plants, valuable in a commercial as well as in a medical sense. He has recognised in the reports that he annually issues the remarkable fact that, notwithstanding the extent of our colonies in tropical countries, not one of them produces tobacco! To meet this great want he has sent gardeners to cultivate this invaluable herb in Jamaica, and we hear that the produce is equal to the best grown in Cuba. In Natal, through his instrumentality, plantations have sprung

up, and now, we hear, they are sufficient to supply the demands of the gold diggers in their neighbourhood. The island of Bermuda has, by his direction, been planted with valuable products. In short, the nursing mother at Kew has done good service in enriching our colonies with valuable plantations, which will conduce to the welfare of their inhabitants for all future generations.

The method of transferring plants where it is necessary to do so, is by means of the convenient Wardian cases, in which the most tender plants can be conveyed safely and in good condition. Before these were invented, plants were conveyed in a ship's hold, subject to all the impurities of salt water and air that such places of carriage are liable to, which rendered the safety of transport of delicate trees and shrubs very problematical. Now, with a little care, the most delicate growths are conveyed from one hemisphere to another quite safely. For years the exchange of floras has been going on; trees as well as settlers are migrating to our colonies, and the vegetable world of the far distant temperate zone is slowly making a footing in our fields and pastures. Of this imperial work the public know nothing; it is carried on systematically and in silence, and the mere holiday folk who throng to these Gardens, imagining that the beauty they see is merely for their gratification, would be astonished to find that from this heart, so to speak,

every dependency of the empire is nourished and supplied with the plants and vegetation that is useful to them.

And, not only our colonists are so supplied, but the home demand is also considerable. From the nurseries of Kew Gardens, Battersea, Hyde, and the Victoria Parks have been planted and renewed with trees. One of the best testimonies to the smooth working and the beneficial action of this public establishment under the present Directorship is the harmony that exists between it and the proprietors of different private nurseries in the country. The profusion of gifts of rare flowers and shrubs constantly flowing in from them not only shows the high estimation in which Kew is regarded as a botanical garden, but the liberal manner in which its resources have been judiciously dispensed among themselves. Of the estimation in which the Gardens are held by the public it is scarcely necessary to speak. The crowded steamers that pass up the river on every holiday and on Sundays and Mondays are a sufficient answer. A few figures, however, will suffice to show the boon the opening of these gardens has been to the public as a mere pleasure-ground to *all classes* of the people, for we scarcely know which class seems the most thoroughly to enjoy them. During the first year, 1841, after the grounds were opened to the public, the number entering the gates was 9174. A gradual

increase took place year by year until 1850, when 179,627 passed the gates. The next year, the Great Exhibition year, saw the number increased to 327,900. Even this large number very speedily became surpassed by the visitors of ordinary years, the number during 1872 being 553,249. No doubt the figures for the last year will give the largest number of visitors Kew Gardens has yet received. The Director, thoroughly taken up as he is with the scientific character of the Gardens, yet has not neglected their popular character. The broad avenue leading towards the Palm-house, during the early spring and summer months, is a triumph of floriculture, as regards mere masses of colour. The rhododendron beds, when in bloom, are perfectly matchless, and the turf beside them a carpet of the most brilliant dyes. However ardent a botanist, this much Dr. Hooker wisely concedes to the vast crowds who come here merely to enjoy the delights of a glorious garden, set in a still more glorious pleasure-ground and park. We heartily rejoice to think that the temporary differences which had arisen between this truly eminent man and one of the departments of Government are now entirely at an end, by the transfer to another office of the person who had occasioned them. But however trying it may have been to

Dr. Hooker to be engaged in so unworthy a contest, he was backed in it by the strenuous support of the whole scientific world, and he received the strongest assurances of the confidence and gratitude of the public.

## POISONS.

IN cases where life and death is concerned, it is of the utmost importance that innocent persons should not suffer in consequence of the uncertainty of our scientific methods of detecting crime. Perhaps in the case of the poisoner, experts are more open to many sources of error than any other class of detectives ; and we must confess that there are so many methods by which poison is administered to us innocently, that persons are continually open to the charge of murder, merely through our want of knowledge of the chemical action of metals upon common articles of food and work.

Let us take, for example, the element water. It would be impossible to mention anything so typical of purity and wholesomeness. Yet, strange to say, the purer and the softer this great natural restorative, the more likely it is to become destructive to life among highly civi-

lized communities. It will often happen that a whole family will gradually fall into ill-health, symptoms of colic will come on, and after a time paralysis,—all the signs of a subtle poisoning of the blood, in fact ; leaving the door open for suspicion of foul play against those that are about us. But, luckily, science has enabled us to discover the secret hand dealing us the mischief, which proves to be not that of crime, but nature herself. All pure and soft water when brought into contact with clean lead becomes slowly poisonous. The metal becomes oxidized, and the compound produced becomes mechanically diffused through the water, rendering it really poisonous to those constantly drinking it. When leaden cisterns and pipes are used, especially when new, this result is very likely to take place ; but no sooner does the lead become dead in colour, that is, protected from oxidization, than this action ceases. It luckily happens that most river waters are hard, and consequently escape this contamination, but it is well to know such a cause of poisoning does exist in what apparently is a very unlikely agent. In towns the beer and stout which we drink in some cases is equally likely to produce results simulating the effects of poison. The acid that exists in these beverages acts actively on the leaden pipes through which they are drawn at the bar. As these liquids are ordinarily drawn, the liquor passes along the pipe so swiftly that but little lead is taken up in the passage, but it unfor-

tunately happens that the beer remains in the pipe all night, consequently the first person who drinks his glass in the morning gets a really poisoned cup. Lead, extensively used in the arts and in domestic life, is poisonous in a score of ways. Hair dyes and cosmetics are compounded of this material, and their use often results in facial paralysis. The workers in Brussels lace (which is whitened by having whitelead beaten into its fibre), the potman who handles pewter pots, and the painter who soils his fingers with white paint, are all subject to be poisoned imperceptibly by this noxious and insidious agent. Snuff and tobacco kept in leaden canisters are sometimes rendered poisonous to those using them, and even the watercresses and the mutton we eat are open in some places to be rendered deadly. A number of sheep having died in a most mysterious manner on the Mendip Hills, a scientific search was instituted as to the cause, when it was found that the soil was impregnated with lead, and on the herbage being examined at Brilded, when burnt, it yielded from 1·6 to 24 per cent. of that metal.

There are several articles of food, again, which under certain conditions are poisonous, sometimes even mortally so. German sausages are sometimes affected with a putrefactive matter which has a most disastrous effect upon those eating them—their extremities rot off. This is a form of poisoning we know but little of

in this country, but in Germany, where polonies are much consumed, the disease is well known. People are sometimes poisoned by eating mouldy bread; several cases have occurred in which death has resulted therefrom. Even fresh brown bread made in London has produced poisonous effects, which have been referred to the presence of darnel seeds in the corn. The effect of these seeds, which, in such cases, must have been ground by accident with the corn, is very curious. The persons eating such bread stagger about as if they were intoxicated, feel giddy, and have violent tremors of the arms and legs; the vision is impaired, and vomiting, deafness, and cramps supervene. A list of symptoms enough to alarm any person, especially as a result of partaking of the staff of life. The public are also at times in danger from eating poisoned game. It is a very common but pernicious practice to steep grain in a solution of arsenic previous to sowing. These seeds pheasants and partridges scratch up and eat, and are poisoned. The birds are picked up and sold to poulterers, and produce when eaten all the symptoms of arsenical poisoning. Why the law allows such a dangerous practice of poisoning corn to be practised is certainly unaccountable. Game that is very high, again, developes a dangerous principle which is often productive of effects very similar to those of poison. Our readers should beware of this when they are tempted to purchase game of hawkers

about the streets. It never gets into their hands until the poulterers reject it, which they are not likely to do until it is more than customarily high. It is pretty generally known that some kinds of mushrooms are poisonous; we are glad to say, however, that the poisonous varieties are very few in number compared to those which are wholesome. One means of testing mushrooms is to boil them with water in a silver spoon. Those that are poisonous tarnish the silver. This indicates the presence of sulphur, which may possibly be a constituent of the poisonous principle fungin. Mussels, again, are sometimes very poisonous, producing symptoms which are very similar to those produced by arsenic, — thirst, rigors, sometimes followed by vomiting, colic, and purging. It has been suspected that in some cases copper has been present in the poisonous fish, which are often detached from the sheeting of ships which is made of that metal. It is well established, however, that copper is not necessary to produce the poisonous result, which is ascribed to some idiosyncrasy in the person partaking of them. It is a very common effect of this article of food, to produce a great rash upon the skin and intense irritation. Many other fish, however, produce a like result. The salts of copper are always very dangerous, nevertheless their brilliant green colour tempts the dishonest manufacturer to use them to give brightness to pickles. Beware of very green girkins, good reader.

This abominable practice is not often pursued now, as it is an indictable offence. If the poison is suspected, its presence is easily detected by placing a steel knitting-needle in the vinegar, and allowing it to remain for a few hours, when it becomes quite discoloured. Very distressing effects, similar to that produced by some of the nervine poisons, sometimes arise from the setting of false teeth made of metal, in imitation of gold; but we shall refer to these sources of poisoning presently. As an article of food many persons cannot partake of pork, but with some individuals it is absolutely poisonous. Liebig believes that the poison is the product of a fermenting principle, and that it operates by producing a ferment in the blood. Of all the articles by which we may be accidentally poisoned, the most treacherous examples are the sweetmeats of children. Many portions of these, such as the leaves of moulded fruits were and doubtless still are coloured with the arsenite of copper, a most deadly poison. Many children have been sacrificed by the use of this deadly material, which is happily now prohibited; but not only children, adults also suffer from the love professional cooks have of giving colour to the articles they send to table. A gentleman was poisoned by partaking of some blanc-mange, which was tinted a rich green colour. On inquiry it was discovered that emerald green had been used, the cook believing it to be an extract of spinach!

Dr. Taylor believes that bakers have a custom of painting their shelves a brilliant green colour, and the hot loaves sticking to them, often takes off upon the crust a portion of the pigment, which contains arsenic. This undetected would produce very poisonous results on the persons eating the bread.

But to return again to the dangerous liking some people have to decorate with colour articles of food. The following case is related by Dr. Taylor: "M. Chevallier relates a singular case, in which arsenite of copper was used by a pork butcher for ornamenting a boar's head, supplied at a breakfast given on a festive occasion by an eminent Parisian lawyer. The head was decorated most artistically with masses of fat, which were coloured red and green. One of the guests, well acquainted with chemistry, was struck with the rich green colour of the fat, and reserved a portion for private analysis. He found the colouring matter to be a pure arsenite of copper, forming about two per cent. of the weight of the fat!" There are scores of other substances into which poisonous materials accidentally find their way, and produce results which often cause suspicion to fall on innocent persons. In many persons, again, we find that what is perfectly harmless to individuals ordinarily constituted, is quite poisonous to some who possess some peculiar idiosyncrasy. In another paper we have fully gone into this subject; but there is such a thing

as intolerance and tolerance of drugs, which produces results very different from what was expected. It would not be imagined, for example, that any harm could come of such a thing as tartaric acid, which we use with carbonate of soda in making effervescing powders, but the following fact proves that it is not always so harmless. At a trial for manslaughter at the Central Criminal Court, in 1845, a person was charged with having given another an ounce of tartaric acid instead of aperient salts. Immediately the person had taken the dose he declared he was poisoned. Vomiting set in and continued until his death, which took place nine days afterwards. That it was nothing more than tartaric acid he had taken was proved by the analysis of the remainder that was left in the cup. A similiar case occurred in France. The accused were, of course, acquitted, but these examples prove that with some people a deadly inflammation can be set up by such an apparently harmless substance. Ammonia, again, is supposed to be a harmless substance. Its vapour in the form of smelling salts, is one of the commonest restoratives we have; but that it cannot be always inhaled with impunity there are cases in the books to prove. A case of an epileptic is reported, who died with all the symptoms of croup a couple of days after the application of ammonia to the nostrils. A strong solution will sometimes produce poisonous results; a boy in

France was poisoned in consequence of his sister pouring several teaspoonfuls down his throat ; and in another case a man was killed by a strong dose in four minutes. Such statements would appear almost incredible, were it not that they were made the subject of judicial inquiry. Hartshorn, again, a seemingly harmless substance enough, sometimes produces death in those partaking of the drug. Dr. Barclay relates the case of a girl, aged nineteen, who, while in a state of unconsciousness was made to swallow a quantity of this drug. She immediately vomited blood, great emaciation and loss of strength set in, and in about three months she died. The tolerance with which poisons may be taken, may depend either upon the nature of the complaint in which they are taken, or upon the influence of habit. The latter has the most powerful effect in rendering inert doses that would ordinarily be fatal. We have a proof of this on a large scale in the manufacturing districts, where the factory women are in the habit of giving their children what they term " quietners ; " in other words, opium, at a very early age, indeed as soon after birth as possible. The object is to throw the children into a stupor so as to allow the mothers to go to work, instead of staying at home in order to nurse them. By degrees infants are enabled to tolerate as many as twenty drops, sufficient to kill four healthy little ones not thus tutored in the use of deadly drugs. The

early habit of taking opium gives the constitution a power of resisting the drug in after life which is very remarkable. Even the powerful poison strychnia has been known to be taken in gradually increasing doses, in amounts that ordinarily would be at once fatal. A gram twice a day has been resisted; in another case three grams a day has been taken for six days following without any poisonous effects. This tolerance of large doses of poison is confined to those of a vegetable origin. Those of mineral origin cannot be administered in the same manner. Arsenic, for instance. Many tales are told of the arsenic-eaters of Styria, in Hungary, and it is asserted that they take large and poisonous doses with impunity.

But all chemists believe these reports to be utterly without foundation. Arsenic is used as a tonic in medicine with great effect; and probably the Styrian mountaineers, who are said to take it for the improvement of their wind, possibly do so in small doses, but not in the poisonous quantities mentioned in Johnston's 'Chemistry of Common Life.' They also administer it to their horses for the purpose of making their coats sleek. Our Yorkshire grooms give it with the same intention, but it is asserted that they often kill the animals by giving them an overdose, the death being ascribed to other causes. Indeed, a case appeared at the Norfolk Summer Assizes, at which some persons were charged with poisoning four horses: in

the defence it was proved that they only gave the drug with the intention of improving their coats, and they were acquitted. According to Dr. Von Tschudi, Austrian grooms give as much as three or four grams a day to their horses, but then it is said to be done conditionally, the dose is only to be given safely about the full of the moon ! Now Tschudi asserts that from two to three grains are given to human beings daily in Styria, not only without danger, but with actual benefit to health. Mr. Kesteven, who has investigated the subject and published many papers respecting it in the 'British Medical Journal,' states that, from his investigations and from a number of facts gathered from the arsenic works of Cornwall, he is convinced that the so-called arsenic of Styria cannot be the arsenic as known in England. This Styrian doctrine, with respect to the use of arsenic as a cosmetic, was brought forward at the trial of Miss Madeline Burth for the murder of S'Angelier. It was asserted that the arsenic which it was proved she had purchased, was procured for the purpose of being used as a cosmetic to wash her arms, face, and neck with. But, unfortunately, it was when purchased coloured, as the law directs, with indigo, which was certainly not calculated to improve the complexion.

Opium, as we have seen, can be taken with impunity in very large doses by professed opium-eaters ; as much as four ounces a day have been taken for eleven

days following without effect. In certain diseases, again, it seems almost inert. For instance, in mania, in tetanus, or hydrophobia, doses may be safely given that are sufficient to kill three or four men. In some cases, again, even small doses are poisonous. It is asserted that Henrietta Maria was killed by a dose of three grains. It sometimes occurs, in important poisoning cases, that it is asserted on the behalf of the defence, that arsenic may be absorbed by the body from outward sources. It was attempted to account for the presence of arsenic in the body of Laffarge, that it was obtained from the oxides of iron which had entered his body whilst about his work as an iron-melter. It is a remarkable circumstance that in order to prove the presence of arsenic in the body, it was boiled down in a copper whilst the trial was going on. Orfila asserted that arsenic was sometimes to be found in the earth in which bodies were buried, and this assertion was afterwards brought forward to account for the presence of this poison in a body that had been buried for many years. It was said that the mould had imparted the arsenic which was found. Upon the trial of Elizabeth Johnson, at the Liverpool Lent Assize in 1847, "The accused, concerning whose guilt, morally speaking, there could be but little doubt, appears to have owed her acquittal entirely to the assumption that arsenic in a solvable form might have found its way into the dead body through a crack in

the coffin, although it had not been shown that the soil of the churchyard where the body was buried contained any trace of the poison. The tests for this poison are exceedingly delicate. Metallic deposits have been found when the arsenic only amounts to a grain in 3000 gallons of water. The frog is made a test in cases when poisoning by strychnia is suspected. The extremely delicate nature of this creature's nervous system induced the late Dr. Marshall Hall to suggest its immersion in water containing a solution of strychnia. Even if there be as little as 1,000,000th part of a grain, the frog is suddenly seized with tetanic spasms. The convulsions of a frog are certainly a delicate matter on which to found a verdict of guilty where human life is concerned, and, of course, the test would only be used in a supplementary manner.



## THE BLIND.

THE loss of the sense of sight seems so terrible that the contented expression on the faces of blind people is puzzling to most of us. It must be remembered, however, that total darkness has been the condition of most of them from birth, or from the earliest infancy, and that they cannot be expected to be depressed at the loss of that which they never possessed, and the value of which they have no means of estimating. It is difficult to say whether it is the greatest misfortune to be born blind or to suffer the infliction later in life. In the latter case, though the loss is very dreadful for the time, yet it often happens when the mind is stored with knowledge, and memory fills the mind with pictures of the visible world, upon which it can always draw when needful, such people have it in their power to dream, which those born blind cannot do. On the

other hand, the sightless from birth feel no regret for the past. Indeed, they confess they cannot understand what it is to see.

The deprivation of sight is speedily compensated in part by the increased sensibility of the other senses. The hearing and touch become most acute. The Rev. Mr. Johns, the Chaplain of the School for the Blind, in St. George's-in-the-Fields, in his interesting work on Blind People, and their work and ways, gives some remarkable instances of this. The blind read character by touch, and they come to rapid, and sometimes clever conclusions, by the method they have of generalising from a few facts. Saunderson, sitting and chatting one day with a visitor, was heard to remark after she had gone, "What white teeth that lady has!" Being asked to give an explanation of the way in which he arrived at this fact, "Because," he replied, "for this last half-hour she has done nothing but laugh." Even those possessed of their eyesight, when forced to depend upon their sense of hearing, are aware of what value it is to them. When in a dark place, the quality of sound intimates the proximity of any object to be avoided; when, for instance, a person may be running against a wall, the motion of the air warns him to stop. If at such a moment we feel as well as hear so acutely, what must the training power of necessity have done for the poor blind man? The blind boys in the St. George's School

know the step of all their school-fellows with unerring certainty. Thus a boy having missed a friend at play, he watches for him as the ranks file past, walking round the greensward or marching into dinner. He hears the tramp of his friend, amid the din and the shuffle of the other boys long ere he has reached him, and pounces upon him with the same certainty as though he saw him. Indeed, the blind speak of hearing and seeing. If from the sound they know the master has left the room, they say, "I saw him go out." It is a curious fact that blind people never run up against each other. Thus, when playing prisoners base—a game which leads to some rough jostling, even among boys gifted with their eyesight,—these sightless little fellows rarely come into collision with each other. Each boy when he enters the workshop in which he is employed at basket-making,—a room 25 feet wide by 160 feet in length,—marches up to his own seat and box, never by any chance mistaking his place. If they are in search of a friend, and they call out his name in an empty room, they never stop for an answer, their sense of hearing telling them that there is no one in it. Mr. Anderson, of Edinburgh, tells a tale which well illustrates this point. "I had occasion," he says, "to send out a blind man with a mattress; I gave him the bill with it, that he might receive payment; but to my surprise he returned with the account and the mattress too. 'I've brought back

both, you see, sir,' said he. 'How so?' 'Indeed, sir, I did not like to leave't yonder, else I am sure we wad ne'er see the siller; there's nae a stick of furniture within the door!' 'How do you come to know that?' 'Oh! sir, two taps on the floor wi' my stick soon tell't me that,'" and the man's estimate proved to be correct.

In any matter in which the fingers are concerned, the blind man comes out triumphantly. In the St. George's Blind School the main employment is basket-making, in which they do as well as those who have their sight; but they also weave. Those who saw the rug in the Great Exhibition which was worked here by a blind man, wondered how the elaborate pattern could be wrought by a sightless person; and, no doubt, many were led to believe that the stories they had heard of blind men feeling the difference between colours was true. The Rev. Mr. Johns, however, says this is not the case. The threads of wool are placed by the weaver's side in exact order, each colour being numbered regularly, so that he can put his hand upon the colour he requires without the slightest difficulty. The pattern of his rug is also indicated upon a board placed before him, which is ruled in cross-bar lines at every point of intersection. At the top line of the board a nail or button is placed, each colour having a different form. In this way he feels the colour he has to place on the line. Thus,

weaving is done wholly by the sense of touch, but the colours cannot be distinguished by the same means.

Reading, writing, and ciphering are all learned by and performed by touch. Types or pins indicating figures of a pentagonal form fit into pentagonal holes in a board some twelve inches by ten. The different form of the head indicates the number. The boys work sums by this instrument with great rapidity. It appears they supplement their work by a mental process; thus they are often able to tell the result of a sum, say in long division, before it is worked out. We are all of us familiar with the manner in which the blind read, by watching the man running his fingers over the raised letters of the Testament in the streets; but the method of writing among the blind is not so generally understood. Every scholar has a folding-board, like a backgammon-board, one half being separated by horizontal bars, whilst the other is covered by flannel or leather. Between the parallel bars he places the movable types, made of wood, in Roman letters, the outlines of the letters being indicated by pins' points. Having spelt out the word backwards which he wishes to write, he places his paper on the leather half of the folding-board, and folds it over upon the type, which prick the letters through the paper, leaving the letters clearly impressed, so that any person of the smallest intelligence can read the

letter,—the prickholes being sufficient indication to the writer to enable him to read the other side of the letter over before finally sending it off. The memory of blind people, as may be imagined, is prodigious. What they have heard is indelibly impressed upon their minds. One of the pupils in the St. George's Fields Asylum can repeat from memory the hundred and fifty psalms, a considerable amount of modern poetry, including Goldsmith's 'Deserted Village,' and the whole of Milton's 'Paradise Lost,' with the marginal notes and a biography of the poet! This is a specimen of the power isolation has to strengthen a particular function of the brain. Difficult as it may seem for blind people to take their part in the affairs of the great world, yet there have been many examples afforded of their having done so with distinguished ability. Above all things, it would seem difficult for a sightless man to become a great naturalist. Yet this was the case with Francis Hüber, of Geneva. He was not born blind; indeed, neither did he become so until he was a young man, and had applied his mind to scientific knowledge. This charming character may be said to have seen with the eyes of his wife. Assisted by her, he was the first to describe accurately the habits of bees, and his theory respecting the queen bee has been verified by all naturalists. Another remarkable man, in an occupation of all others that would appear least fitted for a sightless

person, was John Metcalf, the maker of some of the most difficult roads over the Peak in Derbyshire. Perhaps, however, the most extraordinary genius among blind folk was Nicholas Saunderson, the mathematician, who was born blind. He seemed to have become learned in his art almost by intuition; and by the influence of Queen Anne, aided by his own transcendent ability, was made Professor of Mathematics at the University of Cambridge in 1711, which post he held for many years. At the present moment the Professor of Political Economy at Cambridge, Mr. Fawcett, is a blind man, but he had acquired his knowledge before the unfortunate accident happened to him which deprived him of his sight. Another, and perhaps the most prominent blind man, is the traveller Holman, who has visited nearly every part of the known world.

The statistics of blindness as geographically gathered are totally worthless. As Mr. Johns observes, it depends upon lodging, clothing, and climate. If we were to believe mere numbers, the United States is the most exempt from the terrible affliction, the blind population being in the ratio of one to 2470 of the population, whilst Norway stands the lowest on the list, her proportion being in the ratio of one in 540 of the population. We can understand why there should be a larger percentage of blind people in Norway than in the United States, ophthalmia no doubt

playing an important part in producing blindness in the former country. But why Sweden, which ranges alongside of it and is open to just the same conditions as regards snow, should not contain a third the number of blind people, is past our comprehension.

## FEMALE CONVICTS AND CONVICT PRISONS.

WHEN we look at the grim walls of Millbank Prison, so forbidding and stern, its pentagon shape reminding us more of a mathematical figure than of anything that concerns humanity, we little dream of the strange world it holds within its sombre folds. It seems so silent and so calm that the passions of living beings can have nothing to do with it ; yet, in reality, within its grip fiercer tumults are at work, greater uproars echo within its walls, than are heard in any other building in this island. Millbank is both a male and female convict prison, but in this paper we shall confine ourselves to the latter prisoners only. It is constructed upon the cellular system, that is to say, the prisoners spend the greater part of their time in separate cells, but taking exercise together and attending chapel. Although it is not conducted upon the strictly silent

system, yet the very fact of the prisoners not being in association, practically shuts the convict's mouth during a greater part of the day, excepting when seized with the breaking-out frenzy, which we shall allude to presently. The idea of punishing a woman by cutting off her talking power, no doubt struck the inventor as exceedingly clever; but we fear that practically the thing is impossible, and we are quite certain that it is wholly inoperative as a means of reformation. But of this matter we shall speak presently. It is but natural to conclude that when the heavy prison doors shut upon the prisoners, some of them nominally sentenced to remain within these walls for life, others for various terms more or less long, that all the old ideas—at all events, the vanities of the outer world, and all hope of taking a part in them—would vanish from their minds; but those who have had the longest experience of this class tell us that instead of their vanity being stifled, it burns all the fiercer within them, and the very opposition of the prison rules to its indulgence only stimulates the women to more cunning and ingenious methods of indulging it. When the nun devotes herself to God willingly, she parts with her flowing locks no doubt with a painful resignation, but when the prisoner upon her first admission is asked to deliver them up according to "regulation," it is a very different matter. The "prison matron," who has given us such a sensible view of 'Female Prison Life,'

when remarking upon the rage with which those newly arrived submit to be shorn like so many sheep, says that some of them object to the operation upon legal grounds. The woman will insist that her hair is her husband's, and that the detested scissors dare not touch a hair of their heads,—a curious view this, upon which we should like to hear counsel's opinion; but the scissors are relentless, and the "glory of a woman" is the first thing she is deprived of upon making an acquaintance with the prison authorities. In these days, when the lash has been abolished in the army in consequence of its brutalizing tendency, it does seem strange that this stupid error in the treatment of women should be continued. It may be urged that there can be little self-respect to wound, in a woman who possibly has murdered her children, or committed some crime equally atrocious; but even if this were the case, there can be no justice in applying one unvarying rule to all prisoners. But we question if the commission of any crime, however atrocious, utterly stamps out all self-respect in the human mind; and it is the petty and paltry nature of the proceeding, which looks more like deliberate spite than anything else, which wounds the prisoner. The experience of all who have had to do with prisoners is that it has a remarkable influence upon the convicts. They become sullen, ferocious, and revengeful; or if of a more passionate nature, they make the prison walls ring with

curses and blasphemous language, or the excitement will make them delirious. It cannot be said that the reformation of the convict, which is admitted to be the modern motive of imprisonment, is at all likely to be advanced by this prison method of hair-dressing, whilst the person operated upon is madly raging in handcuffs. They have then to don the prison dress, which is more like a bedgown than anything else, cut in the fashion of 1810, so as to make the waist high up under the armpits. It may, perhaps, be justifiable on the score of economy to dress prisoners in this duster pattern, but what can be the object in making them perfect guys as regards the cut? It is not necessary to study the fashions, but surely the ordinary dress of the period could be as easily made, and would not be needlessly offensive, without any object being thereby gained, unless it be to render female prisoners the infuriate persons they invariably turn out to be when under this modern discipline. Men may make these petty and absurd regulations, but practically it is found utterly impossible to enforce them; and the consequence is that, for the sake of peace and quietness, the vicious and evil-disposed are allowed to indulge in minor attractions and embellishments, which prove that the female convict is determined now and then to be in the fashion. The prison matron fairly confesses that the officers are obliged to wink at this disregard of the prison rules, for the simple reason

that some of these women are utterly untameable ; no punishment conquers their determination, which can only be done, in fact, by killing them, and as this is not allowed they are humoured ! Some of the methods by which the prisoners manage to adorn themselves are amusing enough. One of them, who possibly was in the habit in her free days of heightening her charms like other fashionable ladies, was determined not to forego her toilet within the prison walls. But how was she to obtain the necessary pigments ? Leave a woman's wit alone to find out the way to accomplish the object she has determined upon, and certainly in this instance her ingenuity was worthy of all praise. Of course, the delicate white tints were easily enough obtained by scraping off a little of the plaster, but the pink was a more difficult matter. Yet even that difficulty was conquered. A part of the prison work is to make shirts for the male convicts in the other part of the prison. These shirts are made of blue cotton, striped with red ; out of these latter stripes the woman ravelled a sufficient number of threads to give the colour she required to some water. Thus provided, she appeared one day with blooming cheeks, and as she was really a handsome girl, the fashion spread, and the greatest difficulty was experienced in putting a stop to it. The custom, we are told, still lingers, like many others, which seem to be transmitted from prisoner to prisoner with the greatest

certainty. The prison dress is often altered, we are told, by the bolder women, so as to appear a little more in the fashion. Full skirts are improvised out of the prison sheets; and even stays, which are not allowed with bones, were made during the night by one woman, of a most fashionable shape, the stiffening having been improvised out of the wirework taken from her cell. The hair even after it is cut is an inexhaustible object of adornment among the prisoners, the bolder women wearing it in rolls, etc. This, of course, is utterly against the rules, but, like other weaknesses when not carried to too great an extent, is looked over.

“There is an incessant craving for hair-pins,” says the prison matron, in Millbank Prison, and for the very justifiable reason that hair cannot when long be kept in order without them; in some mysterious manner, therefore, hair-pins and back combs are obtained, and another absurd prison regulation is broken through. Thus fashion is omnipotent even among convicts, and the stern rules silly prison disciplinarians lay down are every day evaded; sometimes the process of circumvention is costly, as, for instance, in the case of looking-glasses. Women are not permitted to have them—but imagine a female without a looking-glass! Of course they have them, but they are obliged to make them themselves; and in order to do this, they smash a window in the cell, smoke it on one side over

the gas, and they have an indifferent substitute for what they want. Perhaps it will be as well to give the daily routine of the prison now that we have seen how the prisoners manage their toilets with variations. At a quarter to six the inmates are rung up by the night guard of each ward, who now goes off duty, and at six the matron of each ward expects to find every prisoner dressed and standing in the cell as she passes along and unlocks it. Those who have special duties to perform, such as cleaning the stones of the yard, or making the matrons' beds, are let out to attend to this duty; the rest have to make their beds and to arrange their cells. At half-past seven they have a pint of cocoa measured out to them, with a four-ounce loaf. Not such bad fare. After the tin plate is cleaned, the labour of the day is commenced. This consists of coir picking, shirt-making, and bag-making. Every woman works alone in her cell without speaking a word, toiling like the bee in his cell, but without the freedom of flying at large when at her daily work. Chapel commences at a quarter to ten: we fear the service does not do the prisoners much good. But few chaplains seem to understand that to receive the sacred precepts of the Gospel, the mind must to a certain extent be prepared. It is utterly useless to fling commandments at men's heads who have been employed all their lives in breaking them. Before the seed can penetrate, the hard ground must be prepared,

and that is only capable of being done by approaching a man as a man, by entering into his feelings, by touching some of the chords which yet are in tune with our general humanity; and there is not a living soul destitute of such chords. It is a long and delicate process to go through, and we fear that from the numbers that throng our prisons, it is not possible to treat each prisoner with sufficient individuality to touch them in any way. As a fact, we know that religious instruction does but little good. Sometimes, when the chaplain flatters himself that one of his flock is truly penitent, the real truth is that he is being played upon by a hypocrite. Colonel Chesterton, the late Governor of Coldbath Fields Prison, in his 'Prison Revelations,' gives a painful picture of the manner in which the chaplain of that prison was imposed upon, and of the ill-feeling he displayed when disabused in his belief. In the Millbank Prison the congregation sometimes behave quite uproariously, and some of the prisoners seem now and then to indulge during the responses and service in outbreaks of fun sadly out of place with the occasion, but which is more due to pure thoughtlessness and want of reverence of character, than to inherent wickedness. After chapel they return to their cells. At one o'clock dinner is served: four ounces of boiled meat, half a pound of potatoes, and a six-ounce loaf being served to each prisoner. Far better allowance than many of our working classes get

day by day, to say nothing of poor needlewomen who never touch meat from week's end to week's end. Indeed, the temptation of the food is so great in this prison, and indeed in others, that many have acknowledged that they steal in order to be sent where such food is to be obtained—far better food indeed, and larger in quantity, than is given to the unfortunate poor in our workhouses, where the old women never get a sip of tea, whilst it is served out here twice a week to ordinary prisoners, and three times to those who have obtained good service marks. After dinner labour in the cells as before, no talking being allowed. As health could not be maintained without exercise, this is meted out to the prisoners in the same silent mechanical manner. The prisoners walk in single file round and round the prison-yard, under the eye of one of the matrons, not uttering a word for one hour. After this mill-work has been accomplished, they return to their cells to work, well aired no doubt, but awfully wearied by the monotony of the proceeding. At five tea is served, then a few prayers are read, each prisoner standing at the door of her cell and listening to the matron reading in the middle of the ward ; work commences again until a quarter to eight, when reading is allowed till half-past eight, when the beds are made, and at a quarter to nine the gas is turned out, and every prisoner is expected to be in bed. This iron routine would be insupportable enough to ordinary

female nature, continued, be it noted, not for months but for years; but when we remember that the class of women who are subjected to it are the wildest of the wild, many of them perfectly untamed and savage beasts when their blood is up, we shall have no difficulty in accounting for what are termed the "breakings out," which seem to be peculiar to Millbank Prison, where every now and then they rage like an epidemic. The ordinary breaking out, however, is the performance of a single woman after the prison is gone to rest. At the dead hour of the night the whole ward will be affrighted with fearful screams, and on the night-watch going to see the reason thereof, he will find the woman smashing her window or tearing up her bedding. Sometimes they become so outrageous that they are put into the padded room; but one powerful woman managed to tear even this down, and to pile the remnants in a heap in the middle of the cell. In ordinary cases, the delinquent is taken off to the "darks," as the cells are called that are used for punishment. Here with only a hard board to lie upon, with a log for a pillow, and a blanket for clothes, they do penance sometimes for eight-and-twenty days, living only upon bread and water. Sometimes these "breakings out" take place in the day. On one occasion two women broke between them nearly four hundred windows. These fits of destructiveness are brought about by the awful effect of the silent system upon

women who have never been taught to govern their tempers. We verily believe they are not free agents in the matter. It must be a great relief to smash windows and scream after the awful and unnatural silence to which they have been subjected. It often happens that they know when the fit is coming on, and then they beg to be taken at once to the "darks," and their wish is complied with. Could any fact be a more striking proof than this that these outbreaks are the natural consequences of the Prison Regulations, which the human nature of the convict type cannot bear? One example of breaking out brings about others; indeed, several will occur in the course of the same night. Like hysteria, the contagion seems to be irresistible; and the prison matron says, that "one matron who has since left the service—a matron of somewhat impulsive disposition—once told me in confidence and with a comical expression of horror in her countenance, that she was afraid she would break out herself; the temptation appeared so irresistible." If these breakings out only cost a loss of rest, it would be bad enough, but the destruction of bedding and blankets and sheets, and of glass, is something very large, all of which has to be made good at the public expense. This would be of little consequence if the silent system wrought any reformation in the prisoners, but it is notorious that this is not the case. That it affects the brain of many of the women, before on the

verge of madness, we know. At the Brixton Prison, where the rules are not so strict and where the prisoners work together in pairs in the cells, these outbreaks are comparatively rare. The women here also have the great relief of a conversation-hour, when their pent-up tongues find great exercise, no doubt. After the prisoners have gained a certain number of good-service marks, they are transferred to this more humanely conducted prison, and the reward is duly appreciated; but some of the prisoners are so incorrigible that they are sent back again to Millbank. And yet among these wild natures some traits of gentleness and kindness are not wanting. One woman at Millbank tamed a sparrow which came at her call; it used to sit on her shoulder. Another time a mouse, which fed from her hand. The prisoner used to take it to church with her in the bosom of her dress—they were inseparable companions in fact, but one day a fellow-prisoner out of spite seized the little animal and bit its tail off, which earned for her the bitter hatred ever afterwards of the mouse's friend. Sometimes we find touches of sentiment among prisoners that are very moving. The prison matron records once looking through the inspection-grating of a prisoner, and seeing her staring at a common daisy that she had plucked from the grass plot in the yard. . . . "The woman wept at last, dropped her head down on the table between her linked hands, and shed her bitter tears secretly and noiselessly."

Who shall say what happy picture of home that little flower brought vividly to her mind? Writing to friends is not allowed, indeed the prisoners are not permitted to have pen and ink; nevertheless, they contrive to communicate in some way, and to their "pals" in the same prison those who can write often manage to communicate. The dodges they are up to in order to get ink and paper are exceedingly ingenious. In order to obtain paper they will pretend that the gas which they light from the inside has air in it, and that the gas paper with which it is lit has gone out. These "stiffs," as they are called, when obtained are put by for writing paper. After school is over they manage to conceal a little ink in their thimbles, pens they secrete in the same way, and having outwitted their matrons, they write to some friend in a distant ward, very often in the most affectionate manner. It is the difficulty of the correspondence which tempts them to undertake it. If they were free to write, the chances are ten to one that they would not do so. These surreptitious epistles are generally conveyed from one to another in chapel, or the note will be pitched at the friend with unerring certainty. Amidst all the checks that are placed between the prisoners, we are informed that it is quite clear that secret freemasonry exists by which they can convey their ideas.

The conduct of the prisoners by no means corresponds to the crimes for which they have been sen-

tenced. For instance, those who have been condemned to death for murder, but whose sentences have been commuted to penal servitude for life, are invariably the quietest and best behaved prisoners. It cannot be that the weight of the death sentence has stunned them, as they express no contrition for their crime, and seem to think that it is quite balanced by their captivity, which, if they behave well, never lasts more than ten years ; indeed if there are signs of mortal disease upon them, the Government mercifully permits them to go away to die among their friends. Indeed, these murderesses form the true model prisoners, always quiet and respectful, and kind to those about them. In many of these cases they have been sentenced for murdering their children ; but there are circumstances in which even this crime may be committed by a woman that is far from being utterly worthless. Passion or misery will turn a woman's brain, and the law is beginning to see this ; and the result is, that women are now seldom hung for a crime which is so abhorrent to human nature, when it is not urged beyond self-control. It has been observed, on the other hand, that some of the women who behave the worst in prison, who are for ever in the 'darks,' who lose their good-conduct badges as soon as they gain them, have been sentenced for comparatively light offences. It is with them a mere case of ungovernable temper. The rage and madness of some of these women when

they are put out at Millbank is terrible. A man, even when he is in a passion, is reasonable; a woman is simply mad, and carries out her intention, totally regardless of all consequences. They will knock their heads against the stone walls, pound their feet against their prison doors with all their might, and exert a power far greater for the moment than that of any man. One of the women in her rage, absolutely tore the grating door of her cell from its hinges; and another, having placed her head, arms, and legs through the grating of her window, defied all the efforts of the warders to remove her, until they tore the whole framework of the grating that she was holding on to away. Yet this woman was not bad-hearted, but she certainly had a bit of a temper. As a rule, those prisoners are fearfully ignorant; very few of them can either read or write, and the little schooling they obtain in the prison is not of much use to them. They hate lessons and arithmetic, even the simplest rules of multiplication or addition are to them apparently incomprehensible. Not only are they very ignorant themselves, but they hate knowledge in other prisoners, whom they taunt with their education. When the time is up with prisoners and the doors of the prison are open to them, they sometimes go almost crazy, smash their windows and tear up their work, and from the dark cell they pass out sometimes into freedom. A matron is generally sent to see them off to their friends;

if they live in the country, their railway fare is paid for them, and a change of under-clothing is given to them,—a thoughtful feature this on the part of the authorities, which contrasts with the cruel silent system they have inflicted upon them. By far the best feature in prison management is the gradations by which the prisoner who has lost her character is enabled to once more enter upon service. The transfer to Brixton Prison is accompanied with many indulgences which are calculated to increase her self-respect; according to their class, they wear particular dresses, no longer the odious duster-pattern check; and after they have passed through a certain probation, they are passed to the Fulham Refuge. Only the better-class prisoners, who evince a desire for a better life, are sent to this institution, which is the porch, so to speak, through which they once more enter the world and all its temptations. It is a kind of middle step between the prison life and the ticket-of-leave, under the qualified restraint of which they enter into service. Of old, when a prisoner left the door of her prison, with a blasted character, there was no choice left her but to go back to her old courses. The evil of this state of things was first seen by private individuals, and the Prisoners Aid Society came to the rescue, and saved many poor creatures from the jaws of destruction, by providing them with situations, or finding them a refuge until they could do so themselves.

The example thus set by private benevolence has been followed by the Government in the establishment of the Fulham Refuge, where there is little restraint. The prisoners are here in association, and only the outer refuge gates are locked. They are treated with far more trust, and with more Christian feeling; and the result is, we are told, satisfactory, and they are taught occupations such as will enable them to earn their own living honestly. From this Refuge they often ask permission to be transferred to the "Home" of the Prisoners Aid Society, which is granted when their conduct can be depended upon. Once under their wing their freedom is ensured. The last step in the treatment of prisoners is merciful and considerate; and no doubt many who are thoroughly reclaimed become ever afterwards, respectable members of society. We wish the first steps of the authorities were equally thoughtful and humane, but this is far from being the case. There is no longer the wickedness allowed in prison that flourished only forty years ago; the males and females, no longer by connivance of the officers, meet on the roof of the prison, as was the case in Coldbath Fields Prison. Tobacco-smoking is stopped, and card-playing and drinking; but the prison reformers have now gone into the opposite extreme, and have invented a system which is too oppressive for human nature to

bear, and which leads to suicide within the walls of Millbank, or to the madness of the prisoner, and her confinement for life at Fisherton or Broadmore Asylum.

## WERE-WOLVES AND LYCANTHROPY.

WHEN we look at the curious forms which insanity took in the middle ages, especially that singular epidemic which, towards the latter end of that period, was known under the term "Lycanthropy," or the changing of men and women into the forms of wolves, under the guise of which, with a vast exaggeration of lupine savageness, they tore and devoured human beings, especially children, we are led to ask ourselves what must have been the condition of the reasoning power of nations,—for the belief in were-wolves was universal at that period,—to have entertained such belief, and not to have recognised that it was a form of insanity which sprang out of the blood-thirsty spirit of the period? The wonder ceases, however, when we remember that up to our own time simple insanity has been mistaken for vice, and the hangman was called in

when the patient ought to have been relegated to the physician. Mr. Sabine Good, who has written a very interesting book on this singular superstition respecting were-wolves, urges that in Europe the idea respecting the transformation of human beings into wild beasts, ravening for the blood of their kind, sprung from a "form of madness or possession under the influence of which men acted as though they were changed into wild and savage brutes, howling, foaming at the mouth, ravening for blood and slaughter, ready to commit any act of atrocity, and as irresponsible for their actions as the wolves and bears in whose skins they often equipped themselves."

This form of madness, which can be traced back to the Scandinavian mythology, may be urged very fairly as the source of the superstition as regards Europe; but when we are assured that it has existed, and we believe still exists in China and Persia to this day, the origin of such an ubiquitous belief is still left unaccounted for in the most populous regions. It does not seem to us necessary to seek for the source of this belief very far. In the dark ages, when the devil was a veritable power, and old women were believed to be capable of changing themselves into black cats, dogs, or any other animals that suited their purpose, it is surely easy to believe that human beings acting like wolves should have been taken as such, and that upon their reappearance in their proper form they should be

looked upon and treated as witches who had sold themselves to the evil one. Those who know anything of insanity are well aware that outbreaks of this nature are peculiarly epidemic; the public are also observant of the fact that no sooner does one madman commit suicide in any startling manner than it may certainly be expected that others will follow suit,—was not the balcony at the top of the monument enclosed for this very reason? In the middle ages, when lycanthropy was rife, the human mind was particularly blood-thirsty. The love of killing, which is strongly developed in man, was then excited by the sports and even the punishments of the period, and the thirst for blood was universal; it can therefore be easily understood that a fury in this direction took possession of persons of disordered brains. In lunatic asylums to this day the insane will do the most atrocious deeds, especially those suffering under seizures of an epileptiform character, which appears to have been the case with these so-called were-wolves. The trials which took place of were-wolves towards the middle and latter end of the sixteenth century certainly startle us by the matter-of-fact manner in which they are reported and the horrors they disclose.

Were-wolves must have been very plentiful in France towards the end of the year 1573, inasmuch as authority was given to the country people in the neighbourhood of Dôle to hunt them down just as they would ordinary

wolves. They were, in fact, ordered to collect with pikes, halberts, and arquebuses and sticks to kill them wherever they were found, especially one who had carried off or eaten several children, and was bold enough to attack horsemen. This loup-garou was, however, ultimately caught, and the story affords a good example of the class of people who were seized with this horrible epidemic. In a most retired spot in a wood near Amonges stood a small hovel surrounded by a little plot of garden-ground overgrown with weeds. This cabin was so far removed from the high-road that few people ever visited the old man who inhabited it; indeed, he was so morose and ill-looking (the epileptic type) that he had no friends. Gilles Garner, for that was the name of the recluse, wore a long beard, hence his name of the Hermit of St. Bonnet, by which he was known. None suspected this old man until one day some peasants, hearing screams in the wood, ran up and perceived a little girl defending herself against a monstrous creature who was attacking and had wounded her in several places. When disturbed the creature ran off, as they asserted, on all fours into the thicket. It was in the twilight, when things are seen but indistinctly; no wonder, therefore, that whilst some affirmed that it was a wolf, others thought they recognised the features of Garner. A few days afterwards a little boy of Dôle was missing. The hermit was now seized upon suspicion,

brought to trial, and confessed to having seized under the form of a wolf a young girl of twelve years old, and of having killed her and drawn her into the wood and gnawed flesh from her legs and arms, taking some portion of the flesh home to his wife. A week after, in the form of a were-wolf, he seized another little girl, but being surprised by the peasants, as before mentioned, he was obliged to fly. The taste of human flesh, however, was now so strong upon him that a week afterwards he seized a little boy of ten years of age a mile from Dôle and strangled him. This he did in the shape of a wolf. He devoured the arms and legs, and tore one of the latter from the trunk. He murdered still another little boy, and was prevented from eating him by some men, who declared that the hermit appeared as a man and not as a wolf. The poor wretch, however, was fully possessed with the idea that he was a wolf. He was burned alive for this so-called crime. Such was the contagious nature of this terrible madness, that a case is recorded of a whole family being afflicted with it, one after another. This occurred in the Jura, in the year 1598. Pernette Gaudillon, a poor girl, was the first seized. She imagined she was a wolf, and ran about the country on all fours. Whilst ranging abroad, she came upon two children who were plucking strawberries. A thirst for blood came upon her, and she flew at a little girl, but her brother defended her with a knife; this

weapon Pernette wrenched from him and cut his throat. It is not said whether she attempted to eat his flesh. The law was not so quick as the popular passion in this instance, as the enraged neighbours tore the poor lunatic to pieces. This did not deter her brother Pierre from following in her footsteps. By means of a salve which he asserted he had received from the devil, he transformed himself into a wolf, and like Pernette ran about the country on all fours. He admitted on his trial that he had devoured in this form both beasts and human beings. To regain his human form all he required to do was to roll himself on the damp grass. His son Georges by means of the same salve became a were-wolf, and ran about the country. His sister Antoinette confessed to having appeared as a black he-goat. Both father and son ran about their cells on all fours, howling. Their limbs were full of scars from the wounds they had received when out on their raids at night by dogs. All three were hung or burned. In this instance, as in many others, the fact of these demented beings running about their cells on all fours clearly shows the dreadful hallucination they were labouring under. The fancied use of the salve to produce the transformation, and the confession which they all made, were symptoms of the insane delusion they, in common with most other lycanthropists, were afflicted with. In this same year, which was prolific of were-wolves' trials, a tailor of Chalons was accused

of having decoyed children into his shop, and killing and eating them. He also followed them about into the woods, and despatched them in the gloom of the evening. This poor demented wretch used to rend the poor little things with his teeth, just like a wild beast; but then he afterwards dressed them and ate them like ordinary food. This poor creature must have destroyed a number of children, as a cask full of bones was discovered in his house. In the same year in a desolate spot some men came upon the body of a boy terribly mutilated, and two wolves who had been tearing the flesh were driven from their repast; the men following them came suddenly upon a man half naked with his hands dyed in blood. His nails, which were long like those of a beast, were clotted with blood and shreds of human flesh. The man, whose name was Roulet, confessed to having killed the lad, and to having devoured a portion of his flesh. He asserted that the two wolves the men had driven away were his two brothers Jean and Julien, who like himself were able to transform themselves into wolves by means of a salve. It was proved at the trial, however, that his two brothers had been engaged far away when Roulet was apprehended. Still one more case, and we have done with these revolting instances of the depths of degradation to which a diseased brain may reduce humanity. This time it is a little boy that was seized with the idea that he was a were-wolf.

He had attacked a young girl as she was keeping sheep in the neighbourhood of St. Antoine de Pizon, but she beat him off with her staff. This led on his trial spoke of having a salve given him, but it could not have been to produce hair, as he was also given a wolf's skin. He admitted that he would have killed and eaten the girl had he been able; that he had on one occasion entered an empty house, where, finding a baby asleep in a cradle, he carried it out into the garden and ate as much of it as he required to satisfy his hunger. On another occasion he had attacked a little girl who was keeping sheep, and, having killed her, ate her. He had regular times for running his courses in the fields and woods,—in the day time, when the moon was on the wane, and sometimes at night. His confession was proved to have been true as far as concerned the murder of the two children. In this case, as in that of Roulet, the public mind, getting the better of its terror, began to see that it was not dealing with crime but lunacy, and both prisoners were treated as being of unsound mind, and therefore irresponsible for their actions. The boy Grenier was sentenced to perpetual imprisonment within the walls of a monastery at Bordeaux; and it is recorded that no sooner was he taken within its walls than he was seized with a fit of lycanthropy, running about the garden and cloisters like a wolf upon all fours, and, happening to spy a heap of bloody offal, he fell upon it and consumed it in an

incredibly short space of time. With these two trials the terrible murders that were perpetrated in the name of the law upon these poor lunatics were brought to an end; and, as far as we can learn, the epidemic to a great extent ceased; were-wolves no longer exciting the imagination of the poor crazy people by reason of the notoriety which attended their trials and execution, the temptation to follow their example was withdrawn. We are by no means sure, however, that among the ignorant peasantry, especially those of France, the loup-garou is not still a thing of fear; indeed, the writer of the book of were-wolves, from which we have drawn the materials for this paper, states that he was on one occasion assured by the peasants that a certain moor over which he had to walk at night was infested with a were-wolf "as big as a calf, its tongue out, and its eyes glaring like marsh fires." And even Mr. Sabine Gould did not think it unnecessary to cut a thick stick after this information from the first bush he met with; of course, to keep off any real wolves that might have been about. It may be mentioned that in the folk lore of England we meet with no trace of the were-wolf. This is a significant fact, and to our mind explains one of the sources of the superstition; our rustics, knowing nothing of this ferocious beast, had nothing to build their diseased imaginations upon. Mr. Gould has not noticed this circumstance. It was only where

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these animals were particularly ferocious, as in France, Germany, and the north of Europe, where there are vast pine forests, that supposed were-wolves existed and traditions of were-wolves are to be gathered. But once a were-wolf, not necessarily always a were-wolf. There were, according to the folk lore of Denmark, certain words by which the compact with the devil could be broken. The following story illustrates this position.

A man from childhood had been a were-wolf. When returning one night with his wife from a merry-making, he observed that the hour was at hand when the evil usually came upon him ; giving, therefore, the reins to his wife, he descended from the vehicle, saying to her, "If anything comes to thee, only strike at it with thine apron." He then withdrew, but immediately after the woman as she was sitting in the vehicle was attacked by a were-wolf. She did as the man had enjoined her, and struck at it with her apron, from which it rived a piece and then ran away. After some time the man returned, holding in his mouth the rent portion of his wife's apron, on seeing which she cried out in terror, "Good Lord, man, why, thou art a were-wolf!" "Thank thee, wife," said he ; "now I am free," and from that time he was no more afflicted. On the other hand, the mere girding of the loins with a strap was said to be sufficient to transform men into were-wolves. Another receipt to become a were-wolf, according to

the Serbs, was to drink the water which settles in a footprint left in clay by a wolf. Were-wolves are still believed in wherever Buddhism exists, and that includes a very large proportion of the human race. In Ceylon, Thibet, India, and China, and we are told also in Abyssinia. In all accounts of the raids committed by were-wolves, we find it stated that the greatest possible exhaustion supervenes upon their return from their expeditions. This fact points to the outbreak being of an epileptiform character, persons after great exertions endured whilst suffering from this affliction generally feeling the most extreme prostration. The love of blood, with the fascination which overcomes some minds at witnessing the torture of their victims, is a disease which history has made us acquainted with in many high personages. Several of the later Roman emperors were blood-thirsty to a degree which brought them within the category of madmen. Louis the Eleventh of France was clearly insane upon the point of cruelty. The desire to kill, and to produce the most cruel agony in the process, was as much a symptom of insanity as the riving and gashing of the flesh of their victims by so-called were-wolves. Many of these instances throw a strong light upon lycanthropy. Poor helpless children in most cases were the victims. With women, the most unaccountable motives and conditions lead to the perpetration of murders and mutilations. It is well

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known that the parturient state, for instance, often leads to the most savage fits of madness, in which women will murder their husbands; and history has recorded several cases in which they have partially eaten them in their frenzy. A more terrible case is recorded, however, of the disease being brought about—or lit up, we should rather say—by vanity alone. The case related by Michael Wagener is illustrative of the slight occasions which will call forth this insane taste for blood. The lady it refers to was of a noble family, who sought to attract her husband by the taste and elegance of her dress. On one occasion, having boxed her maid's ears for some remark upon her head-dress, the blow was so violent as to cause the blood to gush from her nose, some portion, indeed, spirting upon the lady's face. It was observed that where these drops fell the flesh appeared whiter ever afterwards. They acted as a cosmetic, in fact; and vanity being her absorbing diseased impulse, she determined to bathe in blood for the future. In order to obtain victims, she took into her service some children, two old women and a man; but she killed the children herself, whilst they caught the blood. In many cases she beat her victims first till their bodies were greatly swollen. This was done possibly with the mistaken notion of producing a greater quantity of the sanguine fluid. After preparing the poor children in this dreadful manner, she ordered them to be cut up with razors. This woman

was evidently mad, as when she had no opportunity of murdering children, she would stick pins in adults as they were riding with her in the carriage. With the uneven justice of the time—the beginning of the seventeenth century—her companions were tried and executed, whilst she was only imprisoned for life, in consequence, we suppose, of her noble blood. This woman killed in all six hundred and fifty girls.

Possibly, the most dreadful example of the length to which this fearful disease—for we will admit it to be nothing else—ever carried a man, was that of the Maréchal de Retz, a grand seigneur, possessing immense territorial possessions in Brittany. A gallant soldier, who fought on the side of the Maid of Orleans against the English, and a shrewd councillor, the last man in the world one would have supposed likely to have committed the atrocities clearly proved against him, and which he confessed upon his trial. Upon one pretence or another he enticed to his gloomy castle of Mache-coul during the seven years of his residence there, no less than eight hundred children, whom he murdered, with the assistance of two trusty servants. These massacres were all committed in one room of the castle. According to the confession of one of them, “Sometimes he would seat himself on the breast of a little one, and with a knife sever the head from the body at a single stroke; sometimes he cut the throat half through very gently, that the child might languish,

and he would wash his hands and his beard in its blood. Sometimes he had all the limbs chopped off at once from the trunk ; at other times he ordered us to hang the infants until they were nearly dead, and then take them down and cut their throats." The Maréchal frankly admitted the truth of this statement, and explained that he had acquired the taste for blood by reading the history of Tiberius, Caracalla, and other Cæsars, who delighted in watching the dying agonies of tortured children. The Maréchal and his servants were hung, and his memory lives in the romance of Blue Beard, a name he was known by in his lifetime in consequence of the blue shade of his beard when viewed in a certain light. In this instance the original committed horrors that are but feebly followed in the nursery tale. The taste for blood is well recognized as a symptom of insanity; and acts quite as atrocious as those committed by the Sire de Retz now and then occur in our asylums. There is a well-known case, selected from the American Asylum reports, of a black butcher who had been in confinement for many years, and was apparently harmless. One morning, however, he induced another patient to enter his cell, when he cut his throat with a knife he had secreted. The passion for blood once excited, he set to work and cut up the body, ranged the portions around his room, called in the other patients, and, assuming the post of salesman, inquired of his pretended customers what

joints they would like. We question very much whether the Sire de Retz was one iota more responsible for his actions than this black butcher. The age in which the noble Frenchman committed his dreadful acts was not to be blamed for taking his life, seeing that even in these days many a man is hung for some savage deed that should have been recognized as the act of some insane impulse. In another century, doubtless, opinion will have ripened respecting the question of capital punishments, and many an execution of the present day will be looked upon as quite as barbarous and unjust as were some of the executions of old of supposed were-wolves.

The old impulse to imitate the action of the wolf by running on all fours, so characteristic of the special disease of lycanthropy, seems wholly to have died out when it was recognized as a disease, and not as a crime; but the insane taste for human flesh still remains to prove that the main feature that distinguished the were-wolf fold still lingers in insane minds. As late as the year 1849 many children were missed from the neighbourhood of Polomyja, in Russian Poland, but as the wolves had been particularly bold and ravenous that year, those beasts were supposed to have devoured them. And here we may remark, *en passant*, that no doubt the so-called were-wolves, with the cunning which distinguishes the insane person of their class, no doubt imagined that their

victims would have been supposed to have been devoured by these beasts, and they looked to their known savageness as a mask to their own designs. Those who know anything about lunatics will quite endorse our opinion, that they would have been likely to have adopted this kind of reasoning. But to pursue our story. It turned out that a person from whom some ducks had been stolen suspected a beggar who lived in a hovel in the village, and smelling something very savoury proceeding from it, he rushed in, when the beggar was observed to shuffle something beneath his clothes. The clothes were lifted, and the head of a young girl rolled forth. Upon an examination of the hut, the remains of several children were discovered in pickle, or partly dressed. The beggar admitted that he had killed and eaten six children; but the clothes of fourteen were found, and no doubt that number had fallen a sacrifice to his cannibal propensities. The old man took the earliest opportunity of hanging himself in his prison when sent for trial.

A still more horrible instance of cannibalism, which is, perhaps, better known, as it occurred in the neighbourhood of Paris in the year 1849. In this instance it was a young officer named Bertrand who was seized with a longing to disinter and devour the dead in the cemetery of Père-la-Chaise. This young man was at last shot by a spring gun, set in another cemetery which had been outraged, and then he

confessed that he acted under an irresistible desire to devastate graves and to mutilate the dead. It is unnecessary to go into the particulars of this revolting subject ; suffice it to say, he tore many corpses from their graves and rended them limb from limb. He confessed that after committing these excesses he was subject to fits of terrible exhaustion, in exactly the same way as the were-wolves confessed themselves to have been. We look upon this case of Bertrand as a typical instance of lycanthropy in the nineteenth century, and by the light of this case we find a solution of the terrible stories of were-wolves in the past.

## CURIOSITIES OF SOUND.

GREAT was the loss of the public when that admirable experimenter, Faraday, died. His lectures upon common things were one of the attractions of the season in London. How many common things there are that we fail to investigate, and never understand precisely because they are common. The faculty of bringing the results of scientific research within the compass of the public understanding, pleasantly, is one of the most difficult of all arts; it was the one the late lamented Professor greatly excelled in. We are somewhat consoled for his loss, however, by the knowledge that his successor at the Royal Institution, Professor Tyndall, has caught some of his inspiration; and the lectures by the latter on sound at that institution, republished in the form of a volume, prove how charming a somewhat abstruse subject can be made by a

clever man. We use the word sound in common parlance, but how few of us know any of the laws by which it is produced ! Ask the first man you meet the difference between a noise and a musical sound, and he would laugh at what he would take to be the absurdity of the question, but he could not most probably explain it. Yet it is capable of a very simple elucidation. The pigeon when it flies beats its wings with audible intermissions upon the air, making a flapping noise. The humming-bird does the same thing, but so quickly that his wings make a humming sound ; the one may be called a noise, the other a musical sound—the difference between the two is only a matter of time. This is proved by an instrument called a gyroscope, which is nothing more than a wheel with serrated edges. When this is slowly turned, and a card is pressed upon the cogs, a series of sounds like those given out by a penny rattle, is heard, but turn it so fast that it shall make a hundred ticks in a second, and the sound is shrill and musical, all the taps have merged into a continuous sound. The little waves of sound no longer beat individually upon the tympanum of the ear, but run into each other as it were with a smooth intonation. How these pulses of air are conveyed to the brain, and are recognized as sound, is one of those ultimate facts of which at present we know nothing. There are two small bones which impinge upon the drum of the ear, but this anatomical fact does

not help us to understand how the brain recognizes the thing so conveyed as sound. With the laws which regulate these acoustic waves, however, we are well acquainted. They are reflected and inflected just like those of light. That is, their angles of incidence and reflection are quite uniform ; and just as we can throw a beam of light round a corner, by mirrors properly adjusted with mathematical accuracy, so we can throw a sound from spot to spot, so that it can be distinctly heard in one particular distant focus, whilst inaudible in the surrounding space. We have all had experience of this in listening to the echo in the gallery of St. Paul's, and in other places. In a cathedral in Sicily, one of the confessionals was so planned that the slightest whispers were conveyed in this manner to a distant gallery of the building. This fact was accidentally discovered by a gentleman, and the story goes that on one occasion he collected a party of friends to witness the phenomenon, when his wife happened unfortunately to be in the confessional, and possibly more was heard than he would have wished them to hear. There is one difference, however, between the behaviour of light and that of sound ; the latter travels more slowly than the former. This fact we must all of us have observed when witnessing the flash of a distant gun and listening for the report ; or again, in the midst of a thunder-storm, the vivid flash precedes the low rumble as the explosion runs along the edge of a long electric cloud.

If there happen to be other clouds in the vicinity, the thunder is reflected, so that we have a series of explosions. The ear is not always a safe guide to depend upon when niceties as regards keeping time are in question. Thus, for instance, a regiment marching in long column could not keep step to the music of a band in advance. The sound reaching the head and rear of the column at such different periods, that if they depended upon the beats they would be thrown into confusion. A short column would not, of course, be affected by this difficulty.

The transmission of sound through different bodies differs according to their density and temperature. As a rule, it is diminished by increased heat, with the exceptions of iron and wood, which present some peculiarities in this respect. The denser the metal the more quickly sound is transmitted; thus lead is the slowest conductor, and iron the swiftest. The difference between the conductivity of sound by means of air and the latter metal may be tested by listening to a person whilst he knocks an iron bar. If he listens with his ear close to the iron, he will find that the sound reaches him much quicker through that metal than through the air. Through matter which is homogeneous, sound is transmitted equally in all directions; but it is different with wood, which transmits sound more swiftly in the direction of its fibres. This law of acoustics is thoroughly understood by the

makers of fiddles. The manner in which these instruments are constructed is quite artistic. To persons who are not conversant with the matter, the form of the fiddle may seem fanciful, but in reality its structure is perfection so far as its power is concerned as a sounding-board to give the most charming and powerful effect to the vibration of its strings. The belly is made of pine wood, through which sound passes with great rapidity, its back of wavy maple, which throws the sound upwards; the form of the sounding-holes, which appear so fanciful, cannot be altered, we are told, without impairing the quality of the tone.

It is scarcely necessary to state that sound cannot pass through a vacuum. The ringing of a bell suspended in the exhausted receiver of an air pump by non-conducting supports would not be heard, although the clapper moving be distinctly visible. Solid bodies, however, transmit the most infinitely varied sound with the greatest accuracy. We know this, indeed, by the example of the violin, which is but the sounding-board for the strings, which without it would be inaudible at a very short distance. We heard Professor Wheatstone many years ago detail the particulars of an experiment he made by which the sound of one instrument was transmitted from the bottom to the top of a house, to other instruments. For instance, in the lower room he had a piano, upon the sounding-board of which he placed a tin tube, which ran through

several floors to the top of the house. Through the axis of this tube a deal rod passed, the end of which upon emerging from it was surrounded with india-rubber bands, so that the tube was closed. Upon the end of the emerging rod, he placed a violin. The instrument immediately gave forth the air that was being played upon the piano at the bottom of the house, which was of course quite inaudible. It was as though the violin was playing without hands. A guitar was substituted for the violin, that in like manner repeated the tune given forth by the piano through the rod; a harp performed equally well. The long rod was, in fact, a sounding-post such as we see in the interior of a violin. A performance such as this displayed before an ignorant audience must appear nothing less than miraculous. Indeed, if Professor Wheatstone had played this acoustic trick three hundred years ago, he would have stood a good chance of being burnt for a wizard. The experiment, when repeated by Professor Tyndall before a refined West-end audience in the lecture-room of the Royal Institution, seemed so real that the whole audience was amazed as well as amused.

Sound travels at different rates, according to the density or the rarity of the atmosphere through which the wave-sound passes. The intensity with which a sound is heard depends upon the density of the air in which the sound is generated, and not on that of the

air in which it is heard. This may be easily proved. Thus, if two guns, equally charged, are discharged, the one from Chamouni in the dense air of the valley, the other from the attenuated air at the top of Mont Blanc, the gun fired in the heavy air of the valley will be distinctly heard above, but the sound coming from the rare air at the top of the mountain will not be heard below. There is a law with respect to the transmission of sound which is expressed thus—"The intensity of the sound varies inversely as the square of the distance." In plain language, lateral diffusion enfeebles the wave-sound. Practically we know this, for we manage to confine the air in tubes when we wish to convey sounds to any distance with but slight impairment. In most houses of business the head of the firm communicates with his subordinates by means of gutta-percha tubing. Long before the value of this method of conveying sound was practically appreciated, philosophers were well acquainted with its existence. The philosopher Biot, on one occasion when the water-pipes of Paris were empty, found that he could hold a conversation through them at a length of 3120 feet. Of course, the large size of water-pipes allowed of a great deal of lateral enfeeblement of the wave-sound; had the diameter of the pipe been, say a couple of inches instead of twelve inches, he would have been able to have conversed with a friend underground from one end of Paris to the other. An emi-

ment philosopher who lived at the beginning of the last century, but whose merits were overshadowed by the blinding greatness of Newton, appreciated the power of a column of air confined within a tube to convey sound, and with a far-seeing mental vision foreshadowed one of the most important implements of the physician—the stethoscope, with which he now reads the condition of what is going on in the closed cavities of the human body. Writing at a distance of more than a century and a half ago, the scientific imagination of this distinguished man thus forecast what has actually come to pass within these last fifty years. “There may be also a possibility,” he writes, “of discerning the internal motions and actions of bodies by the sound they make. Who knows but that, as in a watch, we may hear the beating of the balance, and the running of the wheels, and the striking of the hammers, and the grating of the teeth, and multitudes of other noises? Who knows, I say, but that it may be possible to discover the motions of the internal parts of bodies, whether animal, vegetable, or mineral, by the sound they make; that one may discover the works performed in the several offices and shops of a man’s body, and thereby discover what instrument or engine is out of order, what works are going on at several times, and be still at others, and the like?” And such an instrument was not only sketched out in the scientific imagination of this philosopher, but was actually

put to the proof, we gather from the following passage :  
 “ And somewhat more of encouragement I have also from experience, that I have been able to hear very plainly the beating of a man’s heart, and ’tis common to hear the motion of wind to and fro in the guts and other small vessels ; the stopping of the lungs is easily discovered by the weezing, the stopping of the head by the humming and the whistling noises, the slipping to and fro of the joints, in many cases by crackling and the like, as to the working or motions of the parts one among another.” From this passage it is clear that Dr. Hook used the stethoscope stethoscopically. But, like many other inventions, society was not sufficiently advanced to accept it. What a splendid article could be written of great discoveries that have fallen dead for ages from the same reason !

The pitch of a note in music depends entirely upon the number of vibrations in the object that produces it. The high notes are the result of very rapid vibrations ; the low notes of less rapid ones. A most singular instrument has been constructed by which the exact number of any vibrations per second may not only be counted but registered. This instrument, which cannot be explained without the aid of a woodcut, makes a note by the rapid emissions of puffs of air, and is termed the siren, for the reason that it will sing under water. Its scientific value to the musician is, however, very great, inasmuch as by its aid the exact pitch of any

note being ascertained by a similar pitch matched to it by the siren—if we may be allowed the phrase—the number of its vibrations registered by clockwork gives the exact shade of sound required. The mathematical accuracy of this singular instrument affords a measure of wave-sounds which will, without doubt, yield rich fruits to discoverers in the future, who may tread in yet undiscovered acoustic paths.

Perfect accuracy in the measurement of vibrations has long been a desideratum. The human ear, nice as may be its discriminating power within its range, is very often but limited within that range. Dr. Wallestone has proved that the limits of hearing differ in different individuals. Some persons hear higher notes than others, some again hear the lower notes. Beyond the limits of their hearing there is total deafness. He says, "The suddenness of the transition from perfect hearing to total want of perception, occasions a degree of surprise which renders an experiment of this kind, with a series of small pipes among several persons, rather amusing. It is curious to observe the change of feeling manifested by various individuals of the party in succession, as the sounds approach and pass the limits of their hearing. Those who enjoy a temporary triumph are often compelled in their turn to acknowledge to how short a distance their little superiority extends." Dr. Wallestone further mentions that whilst one person could but just catch a note

only four octaves above the middle E of the pianoforte, others have a distinct perception of sounds full two octaves higher. In the first case the individual would hear the chirrup of the sparrow, but no higher, whilst the second listener could hear the cry of the bat and that of some insects, at least two octaves higher than that of the sparrow. It often happens that we find low sounds inaudible to us one minute, but audible the next. This fact is explained in the following manner. In order to hear perfectly, the air on both sides of the tympanic membrane should be of the same density. Now the air in the drum of the ear, which is inside the head and tympanic membrane, can only reach that cavity through the eustachian tube which is generally closed. It runs from the back of the throat to the drum. When a person has a cold in the head, the passage is obstructed by the viscid discharges of the mucous membrane of the nose and that passage, hence a difficulty of hearing under such circumstances. But without a cold, sometimes we cannot hear for a moment. In such cases the air in the drum is not the same as the outside air, but the mere act of swallowing opens the eustachian tube, and like magic restores the sounds to the brain that were before inaudible. Deafness is sometimes permanently established by the closure of this passage, but in many cases it can be restored by the mere cleaning it of any foreign body by the passage of a catheter.

Where the range of hearing is very defective, either in the high or low notes, unknown to the individuals, the want may in certain cases affect their testimony in a court of justice, just as colour-blindness or a paralysis of some nerves of the organ of taste may do.

Dr. Tyndall's lecture on the vibration of wires and plates of metal requires the aid of diagrams to make the laws which guide them clear to the general reader. But he showed in the clearest manner how the nodes or points of rest in vibrating strings were divided by the simple plan of placing riders of paper or pith stradling across the string. The passage of the bow producing a note, at once unhorsed the riders placed upon the vibrating portions of the string, whilst the nodal riders remained unaffected. Plates of metal or glass in vibrating transversely, are divided by nodes in the same manner, as their situations are distinctly marked, by the way in which sand arranges itself into different figures when made to vibrate with a bow. A little gum mixed with the sand actually shows us the steps taken by the sand in passing from the points of vibration to the nodal points of rest. The most beautiful fern-like figures are thus produced. Bars of metal that vibrate longitudinally, are most powerfully excited by rubbing them with leather powdered with resin. The elasticity of its own molecules thus produced is much greater than can be produced by the passage of a fiddle-bow. A famous

experiment to prove this, has on more than one occasion been performed before a delighted audience at the Royal Institution. The Professor took a fine glass tube, six feet long by two inches in diameter; holding the rod midway, he vigorously rubbed the upper half, whereby the lower end was excited into such violent vibrations that it was shivered into a series of annular fragments like so many half-crowns. This beautiful experiment can be repeated by any one at home.

Of all instruments the most perfect is the vocal organ of man. The sounds of the human voice are produced by the vibration of the vocal chords, a reed-like apparatus at the top of the windpipe. The sounds given forth by these chords are altered and modified by the resonant cavity of the mouth. The nicety with which the muscles of the throat and mouth act under the direction of the will makes the human voice so musical and charmingly varied in its tones. Many philosophers have attempted to imitate the vocal chords mechanically; and our own illustrious Wheatstone has gone so far as to construct portions of a speaking machine. We have heard this machine utter some of these words very distinctly. The apparatus required to make a doll say "Papa" and "Mamma" is very simple; but the Professor asserts that it is perfectly practicable to make a machine which shall articulate all words slowly but distinctly.

His machine pronounces all the vowels quite clearly. Once asking the Professor what would be the use of inventing a voice when we had so many at present, his answer opened up a new field of thought. "By making the machine of a sufficient size," said he, "and giving it a sufficient blast of air or steam, it could be made the mouthpiece of the commander-in-chief of an army, and give the words of command in a voice that should be heard for miles to every officer on the field of battle." A speaking-trumpet would be indeed but a penny trumpet to such an extraordinary voice as this. Such a machine again would be useful, in the Professor's opinion, to preserve to succeeding generations the dialects and pronunciations of any particular age. These are, perhaps, fanciful applications; but there is no knowing to what uses such an invention may be turned, especially in America, where they like everything on a gigantic scale, from rivers and waterfalls to mountains; there, surely, a gigantic voice may in time be utilized.

Professor Tyndall, in one of his lectures, mentioned the curious phenomenon of singing flames. When a gas jet is enclosed within a glass tube, and the voice is raised to a note in unison with that which would be produced by the vibration of the tube, the flame begins to sing. Struck by this remarkable fact, he experimented further upon these flames: "mounting in this way a series of tubes, capable of emitting all the

notes of the gamut, over suitable flames, with an instrument sufficiently powerful, and from a distance of from twenty to thirty yards, a musician, by running over the gamut, might call every note in succession, the whole series of flames finally joining in the song." But flames can be made sympathetic without the aid of the resonant tube. The ordinary fish-tail burner is subject to the action of sound. Professor Reconte, of the United States, was the first to notice this singular property, at a musical party. He tells us that immediately the music commenced, he observed that the flames of the burners pulsed synchronously with the audible beats. Even the trills of the violoncello were reflected on the sheet of flame; "*a deaf man might have seen the harmony.*" He noticed that as the evening advanced and as the decreased consumption of gas increased the pressure, this sympathetic action became more pronounced. He ascertained that as the flame approximated to the condition of flaring, this peculiar action took place, which he found was due "to the direct influence of aërial sonorous pulses on the burning jet." Acting upon this hint, Professor Tyndall made a series of experiments with naked flames, with very curious results. He found that sonorous vibrations produced rotation in the jets, the flame turning fully ninety degrees round, and its sensitiveness upon the point of flaring proving very great. Thus, in a flame sixteen or seventeen inches

long, it jumped the moment an anvil was lightly tapped or a whistle sounded; another flame twenty-four inches long became marvellously affected. The tap on a distant anvil reduced its height to seven inches. The striking of a bunch of keys violently agitated it; even the dropping of a sixpence into the hand, containing other money, at twenty yards distance, depresses the flame. The crumpling of paper, the creaking of boots, the rustling of a silk dress has the same effect. At the slow repetition of a stanza of Spenser, the flame moved up and down at particular passages, as though the music fluttered through it. The flame has, however, nothing to do with this singular phenomenon; many of the gases behave exactly in the same manner; but without the flame their behaviour cannot be seen in its passage through the air. The flame, therefore, must be looked upon only as a means of exhibiting the movement to the eye. It does not appear that this singular phenomenon can be turned to any practical account; but who knows under this barren discovery as we have it now, what valuable wealth to mankind is hidden which may yet be called forth?

## THE RISE AND FALL OF GREAT FAMILIES.

WHAT we witness in the ordinary course of life, the sudden elevation of persons of mean position and means, and the downfall of persons of good standing, are only familiar and minor examples of the law of social change which is for ever going on. A law which seems to act as independently of the will of the individuals themselves, as the physical laws of Nature act upon inanimate atoms of matter. Looking back over a long space of years, we witness changes in the different classes of society which prove that there is no such thing as fixiture in rank or station. Nature is kinder to us than we are to ourselves; she never permits the goods and the honours of this world to be monopolized for any length of time by any persons or classes. It would seem as though the rich and

honourable were made to descend into poverty, as a reparative process. Ease and sloth breed vices in men, both mentally and physically, which it requires the tonic of poverty to correct. We all know what "blue blood," as it is termed, has led to in some of the Royal houses of Europe.

Luckily in this country there has never been such a strong and impassable barrier drawn between the upper and lower classes as there was abroad; hence our convulsions have never been of such a revolutionary social character. The different classes, like the separate atoms of water, are more freely interchangeable among each other; and families and individuals rise and fall as imperceptibly as the atoms of water rise and fall in a vessel containing it, to which heat is applied. Nevertheless, although there is a noiseless change perpetually taking place between the three different classes in England, there are some families that have suffered vicissitudes so tremendous that they have been observed of all men. Where a name is historical, these changes are registered. Have we not our peerages and baronetages, in which the stages of noble families' elevation or decline is carefully marked. By a study of these, of the upper ten thousand registers, a measure of the changes that are going on among the great mass of the people, may be ascertained in the same manner as by the rise or fall of pressure in the steam gauge, the changes that are

taking place in the boiler may be estimated; or we have a better illustration still in the barometer, which brings before our eyes the changes that are going on from hour to hour in the atmosphere. Sir Bernard Burke, in his 'Vicissitudes of Families,' has given us some striking examples of the changes that have occurred among the higher classes of society. Let us take one of the best-known names in England, that of Cromwell. Ask nine people out of ten who was the father of the great Oliver, and they will tell you that he was the son of a brewer in Huntingdonshire, a story which we are informed rests upon this slender foundation. The family seat of the Cromwells in that county, Hinchinbrooke, which is seated upon the banks of the little stream, the Hinchin, which in fact flows through the courtyard of the house, was supposed at one time before it came into the possession of the family to have been a brewery. On such a slight foundation, public report, and possibly cavalier scandal, built up this tale probably with the idea of sneering at the origin of the great Englishman. The Cromwells, we are told, originally came from Wales, where they bore the name of Williams. Sir Richard Williams, the nephew of Thomas Essex, Lord Cromwell, in the reign of Henry VIII., was befriended by that nobleman, and he managed at the dissolution of the great monastic houses to obtain the Nunnery of Hinchinbrooke, which he converted into a place of residence;

and in consequence of this gift and of monastic land, he altered his name to that of Cromwell. The first of the name was a great favourite of King Henry VIII.,—how little did he see that the grandson of the man he had enriched would have delivered the first fatal blow to the old line of kings in this country. Having shown the elevation of the Cromwells, it is curious to note their decline. On the death of the Protector, his son Richard succeeded to the sovereign power as quietly as though he possessed the crown by hereditary right. After the restoration of Charles II., he descended into private life, and we are told that he was often seen at the Don Saltero coffee-house, at Chelsea, “a little and very neat old man, with a most placid countenance, the effect of his innocent and unambitious life.” The children of Oliver’s second son, Henry Cromwell, were the male lineal descendants. A son of Henry was Thomas Cromwell, who carried on the business of a grocer on Snow Hill, and died in 1748, and his only son, Oliver Cromwell, was a solicitor and clerk to St. Thomas’s Hospital. Singularly enough he succeeded under the will of his cousins, the Miss Cromwells, to an estate at Theobalds, Herts, which had been granted by Charles II. to General Monk, for his services in restoring the monarchy! Thus “the whirligig of time brings in her revenges.” With this clerk to St. Thomas’s Hospital, the male line of the Cromwells expired. The female line fell still

lower. This branch descended from Elizabeth Cromwell, daughter of Henry Cromwell, Lord Deputy of Ireland. Of the children of Elizabeth, the eldest married a man who dissipated her fortune, and died in a workhouse, leaving the widow in the bitterest poverty; one of her children was married to a butcher's son and a fellow-servant to the other daughter, who had married a shoemaker at Soham. The great-great-grand-daughters of the Lord Protector fallen to the most menial service within a hundred years of his death! Another of Oliver Cromwell's great-granddaughter's descendants were, respectively, a small working jeweller, and the mistress of a little school at Mildenhall. Had this family been on the other side in the struggle of the civil wars, no doubt they would have flourished like the descendants of Monk.

In contrast to this remarkable decadence of a great political as well as aristocratic family, we may place the astounding rise of another from the ranks of the people. We allude to the Brothers Baird, of Gathorne Ironworks. They were the children of a small farmer of that name, living in the parish of Monkland, near Glasgow. They owe their position of the first ironmasters in Scotland to the development of the iron and coal trade in the Monklands. They did not acquire this position without rare sagacity and good fortune. They took fortune at the flood; and the quick development of the natural resources of the neighbourhood in

which they lived, speedily enabled them to rival the Guests and Baillies and Crawshays of the southern part of the island. These children of the small farmer and of a farm-servant have now swallowed up the estates of some of the most ancient families of Scotland. Lord Lovat, Mr. Barclay-Allardice, Sir John Pringle, and Sir James Stuart-Monteth, and the ancient family of Baird, have all, by the force of circumstances, which melts down the inheritance of the great, been compelled to build up the territorial possessions of these two successful merchants. Nothing is more wonderful than the rapid rise of the sons of industry and commercial speculation in the present century. By the legitimate pursuit of the arts of peace, they acquire far larger fortunes than did even the gold adventurers in the sixteenth century. It remains to be seen, however, if they will retain their meritorious gains. The tendency to acquire large estates, to seize the land, not by fraud or force, but by legitimate means, has a vast conservative influence; and, possibly, the Bairds, in the course of a century, if they survive so long, will in their turn found a noble family, loaded with public honours, and buttressed by aristocratic connections, until in its turn it will topple and fall by its own weight and magnificence, and some future energetic son of toil may possibly rise and push them from their seats. Ireland has presented many remarkable examples of strange family vicissitudes;

but within the memory of the present generation a most remarkable instance is the total destruction of the Martin family, of Ballynahinch, in the county of Galway. The possessions of this family contained one hundred and ninety thousand statute acres of fine wooded and watered land, extending from the town of Oughterard to Clifden and Cloggin Bays in the Atlantic Ocean. It was the boast of the grandfather of the last possessor to George IV. that he had an approach from his gate-house to his hall of thirty miles in length. The improvidence of the race of Martins had greatly encumbered it, but when it came into the possession of Richard Martin, the last male owner, although greatly encumbered, it was still entire. The undeveloped wealth of this vast estate was immense; and, probably, had it been brought into cultivation, and its great quarries of marble and other stones, its woods and water, been productively employed, it would have proved to have been the most valuable estate in the kingdom. But the most unhappy fortune overwhelmed its possessors. Richard Martin, when he ceased to be returned to Parliament, was forced to fly to France to escape his creditors. Upon his death at Boulogne, in 1834, his possessions reverted to his daughter, who was styled the Princess of Connemara. This lady was successful in keeping the property together for a time. By the frugality of her mode of living she managed to pay off the interest

of the various mortgages ; but she spoilt all by making a love match in 1847, as she and her husband joined in borrowing a large sum of money from the Law Life Assurance Company with a view to consolidate the incumbrances on the estate at a lower rate of interest. This was a prudent measure ; and were it not for an unforeseen circumstance might, in the course of time, have cleared the property, but the luck was against them. The year of famine came, the tenants ceased to pay any rent, and they were unable to meet their mortgage engagements, and the Insurance Company would give them no time. The consequence was that the entire property came into the Encumbered Estates Court, and the family were broken up. At that time, when so many Irish estates were thrown upon the market, this princely domain scarcely realised the amount of the liabilities upon it, and the last descendant of the race was left absolutely penniless. In this sad state of her fortune she went to Belgium, where she attempted to support herself with her pen ; failing in this she determined to emigrate to America, but fortune was still relentless, and she died in childbirth during the voyage. The purchaser of this vast estate was the unmerciful Company. It was of course a strictly commercial transaction, but the enormous profit the Company made out of it, in consequence of a pure misfortune, was not calculated to inspire the tenantry with any love for their new land-

lords, and to this day they speak of the estate as Martin's land. Richard Martin, the last possessor, was the man who carried through Parliament the famous Act with reference to Cruelty to Animals, with which his name is associated. It seems doubly hard that one so merciful should have been so unmercifully treated both by man and by nature.

History has made every one familiar with the heritage of woe which fell to the lot of the royal house of Stuart. We need not recount the number of monarchs that lost their lives, or became "out of business," or were unfortunate in other ways. With the picture of the old Pretender and his son, the Bonnie Prince Charlie, we need not meddle, as they are to be found in all histories, but the fate of the last male heir of the race of kings is not so well known. Henry Benedict Maria Clemens, the second son of the old Pretender, was destined to close the royal line and at the same time to put an end to the intrigues of a faction in this country, such as we witnessed during the middle of the last century. He was born in the year 1725, and, like his brother, was brought up in the hopes of being restored to his ancient honour by the aid of France. In the year 1745 he was preparing to invade England with an army of fifteen thousand men, but the defeat of his brother at Culloden defeated this design, and he retired to Rome, where he became a priest, and was made a Cardinal

by Pope Benedict XIV. Here, as Cardinal York, he lived some years in princely splendour; but the fate of his family in his latter days overtook him. Upon the expulsion of Pious VI. by the French, the Cardinal, then feeble and distressed in circumstances, fled to Venice. Here he was obliged to subsist upon the proceeds of some plate which he had rescued from the ruin of his property; this being expended, he sank into such a condition of poverty that his condition was made known to George III. This monarch could afford to be generous to this last member of the elder branch of his family, and he immediately sent him a present of £2000, with an intimation that an amount of £4000 a year was at his disposal as long as his circumstances required it. This offer was with gratitude accepted, and the Cardinal continued to receive it until he died, in 1807, at the age of eighty-two. With him ended, we believe, the line of the Stuarts. After he became a priest, he seemed to have taken leave of politics and worldly affairs, with one exception. Upon his brother's death in 1788, he had medals struck, bearing on the face a representation of his head, with this inscription, "Henricus Nonus Magnæ Britanniae Rex; non voluntate hominum, sed Dei Gratiâ." The present heir, through the female line of the Royal Stuarts, is the Duke of Modena. This prince has inherited the fate of his family, inasmuch as the reconstruction of the kingdom of Italy has

deprived him of his sovereign rights. It is certainly a strange circumstance that in this prince's family is vested the heirship of the elder dynasties of the three great monarchies of Europe. His eldest sister, Theresa, is married to the Comte de Chambord, *de jure* King of France; whilst his younger sister, Mary, wife of John of Spain, is mother of Charles, who stands in the position of heir presumptive in the male line to the monarchy of Spain. It would seem as though the fate of the Stuarts had affected, in a triple degree, its very latest descendants.

Another monarch retired from business was Theodore, King of Corsica. This unhappy prince, after he was obliged to retire from his kingdom by the Genoese, found a refuge in England, but his means entirely failing him, he was detained in the King's Bench for debt, and was only released to die. Horace Walpole gave a history of his life, in which he compares his conduct after he was dethroned favourably with that of James II. He was buried in the church of St. Anne's, Soho, where there is a marble monument thus inscribed by Horace Walpole :

“Near this place is interred  
Theodore, King of Corsica,  
Who died in this parish, December 11th, 1766,  
Immediately after leaving  
The King's Bench Prison  
By the benefit of the Act of Insolvency;  
In consequence of which  
He registered his kingdom of Corsica  
For the use of his creditors.”

One evening, says Dr. Doran, nearly forty years afterwards, "an old man, one night in February 1796, walked from a coffee-house at Storey's Gate to Westminster Abbey. Under the shadow of which, he put a pistol to his head, pulled the trigger, and fell dead. The old man was the son of Theodore, Colonel Frederick. He, too, had been unfortunate; and it is related as one of the singular episodes of his life, that on one occasion he dined at Dolly's Chop-house with Count Poniatowski, when neither the son of the King of Corsica, nor the man who was to be the future King of Poland, had sufficient money with them to enable them to pay their reckoning. A grand-daughter of Colonel Frederick, at the beginning of the century, was still alive, and earned her livelihood as an artist. Her pride was certainly subservient to her purse, as she was not above making capital out of the misfortunes of her family. Her card was thus inscribed:—

MISS CLARK,  
Grand-daughter of the late Colonel Frederick, son of  
Theodore, King of Corsica,  
Paints likenesses in miniature,  
From two to three guineas.  
No. 116, New Bond Street.  
Hours of attendance from twelve in  
The morning until four.

But, as Englishmen, we do not feel the same sympathy with persons of foreign birth, however great may have been their fall from even regal days, as

we do with our own families that have been seated in their ancestral homes for centuries. One of the most terrible examples of descent from high estate to most abject poverty is afforded by the family of the Conyers, once a proud Norman family, possessing large estates in the county of Durham. They dated their family from the days of the Conqueror. One branch of the family was seated at Sockburn, where they had a noble house and broad lands ; another at Hornby, in Yorkshire. One baronet of this line, Sir John Conyers, of Horden, was possessed of a stately seat known to all Londoners—Charlton House, Kent,—afterwards in the possession of Sir Thomas Wilson ; a fine old mansion of the time of James I., for whose son, indeed, Prince Henry, it was built. During the early part of the eighteenth century the various branches of the Conyers family were distributed in the following manner. The heirs and assigns of Anne Conyers, Countess of Shrewsbury, held Sockbourne ; Conyers D'Arcy, Earl of Holderness and Baron Conyers, the head of the second branch, held Conyers Castle, at Hornby ; and Sir John Conyers, the male chief of the whole family, was located at the courtly seat at Charlton, having left the ancestral home of Horden.

What splendour have we here ! What gallant living, what proud old houses, inhabited by a race elevated far above the vulgar wants of humanity ! So much for this view ; and now let us exhibit one fresh

tableau, representing the proud chief some ninety years later. This time he is seated in no ancestral hall, among no gallant company; but huddled up with mean paupers in a workhouse. The old man who is the figure that we notice is Sir Thomas Conyers, and the workhouse is that of Chester-le-Street, in the county of Durham, where the grand old hall of Sockbourne is situated. The poor ruined baronet, reduced to the poor-house, yet maintains his pride of birth. To the noble-hearted friend who came to him with a proposal of relief, his proud form lost its stoop for an instant as he declared he was no beggar. The old man was not proof against kindness, however, and ultimately he was induced to quit the workhouse for private lodgings, where he speedily died. He left behind him, however, three daughters, who were married to day-labourers in the neighbourhood; and at this moment some of the oldest blood of the county may be found in some of its humblest dwellings. Having given an example of the head of an old family reduced to the pauper class, we may balance the account by relating the adventure of the Yorkshire groom and stable-boy, who within our own time ended by becoming the prime minister and personal friend of one of the oldest reigning ducal houses of Italy. The Duke of Lucca, like the head of the House of Modena, representing some of the most mighty families of Europe. The grandfather of

Thomas Ward, known by the title of Baron Ward, was a day-labourer in the parish of Horden, in Yorkshire, and his father was stud-groom to a Mr. Ridsdale, a trainer. Thomas had the luck, if we may so term it, of being sent, in the year 1823, with a horse to Vienna, and there he entered the service of Prince Aloys von Lichtenstein, as a stable-boy. Here he behaved himself so well that he was selected to ride the horses of his master at the races. From this employment he was promoted to that of the Duke of Lucca, a member of the royal house,—this was about the year 1830,—in whose establishment he became valet de chambre, and ultimately rose to the position of confidential attendant to the prince; and so well managed his affairs, both of a private and political nature, that he was ennobled and offered a portfolio in the ducal service, which he at first refused, but ultimately he was prevailed upon to accept the post of Minister of Finance,—not so bad for a Yorkshire stable-boy. The straightforward manner in which he managed affairs amid the small world of diplomatists gave him a great advantage; his want of professional skill often enabled him to accomplish matters that he never could have managed by the rules of art. Like the servant-maid fencing with the skilled fencer, in the ‘*Bourgeois Gentilhomme*,’ his direct thrust could not be parried by the ordinary rules of fence. When the duke succeeded to the dukedom of Parma,

Baron Ward accompanied him and became his prime minister in his new territory, in which capacity he remained, conducting the affairs of the dukedom with infinite tact and skill. Upon the death of the duke, in 1854, the baron was by his widow deposed from the ministry and banished. The late prime minister retired to the neighbourhood of Vienna, where he undertook a large farming establishment and spent the remainder of his days in the enjoyment of domestic happiness with his family. He died in 1858, at the age of forty-nine, happily before the downfall of the family he had so long truly served. The Prince Metternich called him a "heaven-born diplomatist," a very high encomium from a man who was considered the head of his craft. Baron Ward, when he came to England, used to visit his old home, and the prime minister entered into his old life with his relatives, still labouring men and women, with the simplicity of a child. Thus we have, as a pendant to a picture of a baronet fallen to the condition of a pauper, ranking with the broken-down creatures of a workhouse, the son of a labourer elevated to the position of chief officer of an ancient state, and dignified with the title of a noble. The vicissitudes of life could scarcely be better marked than in the lives of these two men. The sudden rise or fall of our great railway contractors has yet to be written; possibly another turn of fortune may yet place them in their old positions.

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Certain it is, that the vast mercantile undertakings and the gigantic manufacturing operations of the present day render the vicissitudes of the trading class of the community more marked than at any period of our history. As wealth increases in our great manufacturing centres and commercial marts, the trading class will tread more closely than ever upon the skirts of the landed gentry and nobility, and estates are doomed no doubt to change hands more rapidly than in the old days, when agriculture and land were paramount. Mr. Burke, in his introduction to his '*Vicissitudes of Families*,' gives the following remarkable instances, with which we conclude this article.

"Let us look back only as far as the year 1637, and we shall find the great-grandson of Margaret Plantagenet, herself the daughter and heiress of George, Duke of Clarence, following the cobbler's craft at Newport, a little town in Shropshire! Nor is this the only branch from the tree of royalty that has dwarfed and withered. If we were closely to investigate the fortunes of the many inheritors of the royal arms, it would soon be shown that in sober truth—

'The aspiring blood of Lancaster  
Had sunk into the ground.'

aye, and deeply, too. The princely stream flows through very humble veins. Among the lineal de-

scendants of Edward of Woodstock, Earl of Kent, sixth son of Edward I., King of England, entitled to quarter the royal arms, occur a butcher and a toll-gatherer; the first, a Mr. Joseph Smart, of Hales Owen; the latter, a Mr. George Wilmot, keeper of the turnpike-gate at Coopers Bank, near Dudley. Then, again, among the descendants of Thomas Plantagenet, Duke of Gloucester, fifth son of Edward III., we discover Mr. Stephen James Penny, the late sexton at St. George's, Hanover Square—a strange descent from the sword and the sceptre to the spade and the pickaxe!”

## WEATHER BY TELEGRAPH.

IF we knew certainly the direction in which the wind was about to blow, we should be able to make very shrewd forecasts of the coming weather. The late Admiral Fitzroy, when head of the Meteorological Office of the Board of Trade, inaugurated a system which he fondly hoped fulfilled the desires of the mariner, and enabled him to say in advance the kind of weather that was to be expected. The Admiral was an energetic and sanguine man, and having been successful in some of his weather forecasts, he generalised very widely from insufficient data, and the consequence was that all his forecasts were not successful. It is but due to his memory, however, to state that the machinery he set in motion to obtain his information is still continued by the present head of the Meteorological Office. In order to obtain any just

notion of the currents of wind that are blowing about our coasts, a staff of observers are necessary. At the present moment there are eighteen stations in Great Britain and Ireland, in places having telegraphic communication with the metropolis. Nine of these stations are in England, situated at North Shields, Scarborough, Yarmouth, London, Portsmouth, Weymouth, Plymouth, Penzance, and Liverpool. One in Wales,—Holyhead; and four in Ireland,—Greencastle, Valencia, Cape Clear, and Roche's Point, at the mouth of Cork Harbour; and four in Scotland, at Nairn, Aberdeen, Leith, and Ardrossan. At each of these stations the observers are supplied with barometers and thermometers, and a rain gauge. In addition to these, such coastguardsmen as are situated upon a telegraphic line have been instructed in the use of the weather instruments, and day by day their weather reports are sent up to the Meteorological Office, where they are compared, and the probable changes in the atmosphere are forecast. Admiral Fitzroy imagined he was in possession of sufficient data to determine not only the approach of storms, but the direction from which they would blow. An investigation of these storm-warnings, however, has proved that, whilst he was right in seventy-five per cent. of his warnings as to the force of the wind, in only thirty-five per cent. was he right with respect to its direction. Now, although it is very important to know that a storm is

brewing, it is still more necessary to know from what quarter it will come. It was fondly hoped that the mariner would be forewarned before leaving port whether the wind that awaited him would carry him on his voyage, or was likely to drive him on a lee shore. This would indeed have been valuable knowledge; but the fact that only thirty-five per cent. of the predictions were verified by after events, clearly showed that they were made upon insufficient data. As a consequence, the Admiral's signals fell into partial disfavour, especially with merchants, who did not care about the detention of their vessels for fear of opposing gales which never came. Nevertheless, the information gained by the trained watchers has not been totally valueless, even as respects our knowledge of the direction of the wind. It is now well ascertained that all great storms move in a circular, or rather, in an oval direction; they are vast atmospherical eddies, if we may so speak. In northern latitudes these cyclones, which are of all sizes, move bodily from the south-west to the north-east. Although moving at a rapid rate, yet they do not pass so fast but that notice may be given by the telegraph of their approach. The 'Royal Charter' storm was the first well-noted cyclone which came within the scientific inquiry of Admiral Fitzroy. This hurricane commenced in the Bay of Biscay, took a direction across England, and finally passed off along the coast of Norway. The changes in

the direction of the wind in this great storm were very sudden, boxing the compass within the twenty-four hours. The circular nature of many winds accounts for some peculiarities respecting them which were very puzzling. Thus, it seemed quite unaccountable that a wind blowing from the south was often very cold. The explanation of this fact is simple enough. The south wind is a polar gale twisted upon itself. Among the signs of coming atmospherical disturbance are, first and foremost, the rapid rise or fall of the mercury in the barometer. This fact has long been noted by the mariner, who no sooner sees the fall of the quicksilver in the tube, than he orders all hands to shorten sail and make all snug, well knowing that a hurricane will soon be upon him. If, again, in mid-winter the weather is damp and warm, there is danger of a storm. Again, if the wind backs instead of veering, bad weather may be expected. A wind is said to veer when it changes with the sun; that is, when a north wind changes to the south through east. When it changes in the reverse way,—namely, from north towards the south through west, it is said to back, and in such cases the weather is likely to be bad. The gales we most commonly experience are those from the south-west and north-east quarters. A south-wester is a noted blustering gale, which brings rain. This wind is called the equatorial current; it is bred in the Gulf of Mexico, and accompanies the

Gulf stream from that tropical boiler, which sends a broad stream of hot water like a river through the midst of the Atlantic Ocean. The current of air follows the course of the water; it brings vast clouds which are precipitated upon our shores. When that wind is about to blow the barometer falls. The opposite current is termed the polar current; it is bred in the ice-bound north. The advent of a gale from this quarter is marked by a rise in the barometer. It is lucky that the vast majority of our storms in this country come from the south-west, as these give us timely warning of their approach. North-easterly storms, on the contrary, give but little warning, and they are generally followed by disaster to the shipping.

Upon the approach of a storm the intelligence is telegraphed to sixty stations. In the time of Admiral Fitzroy, not only the approach of a gale was notified by the system of signals to the seafaring people, but the direction from which it came. This was done by day by means of warning signals hoisted upon masts. Thus a cone with its apex upwards denoted a gale probably from the north. A gale probably from the southward, on the other hand, would have been signalled by hoisting a drum with its apex downward, whilst a simple round drum denoted that a gale may be expected from nearly opposite quarters successively. The addition of cones to these drums, placed to point either upwards or downwards, denoted that the dangerous

winds were to be expected at first either from the north or south. By night, coloured lights similarly arranged, gave the like signals. With the decease of the Admiral, however, the forecast of the direction of the wind was given up. The present clerk of the weather does not profess to prophesy as to what the weather will be like, he simply announces that atmospheric changes are at hand. The warning intelligence is not intended to interfere with local knowledge. It simply implies, "Look out, bad weather may be approaching you." It is quite as well that the prophet has grown modest in his forecasts. The science of meteorology is at present in its infancy; and the attempt of the Admiral to put a larger interpretation upon the limited number of facts at his disposal than they warranted, led seafaring people to think his prophecies sometimes untrustworthy. It is gratifying to know that the Government have established this office as a department of the State, annually credited with a vote of £10,000. Acting in concert with the Meteorological Committee of the Royal Society, it is put upon a strictly scientific basis, and no doubt the facts that are accumulating from day to day under the inspection of such observers, must result in the discovery of some general laws with respect to changes in the weather which will be thoroughly trustworthy. At the present moment the simple round drum denoting the advent of dangerous winds, is all that is

attempted, but the object of the present scientific directors of the office is to convey to each station intelligence of the wind that is blowing in a certain line of coast, and also of the locality where that wind is blowing. In order to do this, a semaphore, by Captain Toynbee, is being constructed, which is intended to show the direction and the force of the wind in the different districts. This plan certainly releases the directors of the office of the responsibility of making even a scientific guess at what the weather is likely to be, but we do not see that the seafaring mind, unaccustomed to work out particular results from general principles, will be able to make much use of this complicated semaphore. Local knowledge will make nothing of it, that we think is quite certain. Those who possess the facts at head-quarters, will have to work out the sum, and it will eventually come to a resumption of the post of weather-prophet by the committee. Our efforts in the department of meteorology have led other nations in the same direction. In France, M. Le Verner publishes the daily bulletin of the Observatoire Imperial, containing reports from upwards of sixty stations situated in various parts of Europe, and he telegraphs to certain French ports, and to our own meteorological office, the state of the weather. In Holland, Dr. Buys Ballot's meteorological investigations have led him to the conclusion that the direction of the wind which blows at any station can be foretold

by means of a comparison of the barometrical readings at adjacent stations. In Italy, Austria, and Norway, a daily *résumé* of the weather is made, and when storms are expected, signals are hoisted. Now that a rivalry has sprung up between the different nations, and the area of observation is being extended over the greater part of Europe, more reliable returns may reasonably be expected. The education of seafaring people in the reading of the barometer and the thermometer, is a matter of importance. It must not be supposed that no training is required to be master of these implements. The meteorological department of the Board of Health fully understand this, and where a maritime community is poor and removed from telegraphic communication, they undertake to provide them not only with a manual of instruction, but with the thermometers and barometers necessary. Men who once practised on these implements take a pride in keeping up their knowledge ; it gives them an air of importance in the eyes of their fellows which is often very amusing. There are some popular errors connected with the reading of these instruments which require to be corrected. For instance, many persons fully believe that a rising barometer and a falling thermometer indicates fine weather ; this may be the case in many instances, but when the rise is at all sudden, it is an indication of the approach of a polar gale. The cold and heavy air blowing from the north-west, or north-

east, of course exerts a great pressure upon the open end of the barometer, and of course the mercury ascends in the end watched by the observer. As we have said, the fall of the mercury in the barometer ten degrees is a sure sign of an approaching hurricane; and a fishing fleet that should put off in the face of such an indication, would be wilfully rushing into destruction. The weather wisdom of old sailors is founded upon just the same evidence as that of scientific meteorologists,—experience; therefore, what we may popularly term the weather office, by no means attempts to discredit this kind of lore. There is an old saying,

“ Long foretold long last,  
Short notice soon past,”

which is very true. Admiral Fitzroy was very fond of quoting these sayings of the “old salts.” There are certain signs in natural objects and things, which should be taken in conjunction with the reading of the instruments, if we wish to make a probable forecast of the weather. For instance, when sea-birds fly far out to sea fair weather may be expected; on the other hand, when they hang about the shore or fly landward, we may be sure that the instinct of the birds teaches them that hard and stormy weather is at hand. Land animals also give signs that may be watched with advantage. Thus, when they seek shelter and no longer rove fearlessly about the pastures, it may be judged

that rough weather is at hand. A good hearing day is an indication of rain; on the other hand, when much dew falls fine weather may be expected; fog is an anticipation of a fine day. But when the air is very clear near the horizon, when the mountain outlines are particularly sharply cut, those born among them know that storms will certainly follow.

Before the invention of the electric telegraph, any attempt at warning our sailors of approaching storms was out of the question; now that the wire has practically brought every place in telegraphic communication with the weather office up into the room of the director, not a fishing village on the coast should be allowed to send boats to sea without being fully warned of the weather they may expect within the next twenty-four hours. It is true we have not got the telegraph laid along our coast-line, and we are told that it would require four thousand miles of wire to connect together the various life-boat stations, and probably a much greater length to place every port and fishing village in communication with each other. Until this is done the practical value of meteorology, as far as our seafaring population is concerned, will not be fully apparent. With respect to the life-boat service, it often happens that a crew perishes long ere the life-boat can reach them; this could scarcely happen if the telegraphic wire searched every inlet and bay of our island, within reach of a preventive service station, for these officers

have been, by consent of Government, enlisted in the service of the meteorological office. Sooner or later this coast-line telegraph must come; and when this scheme is carried out, many of the islands on our coast on which light-houses are placed, always the scenes of marine disaster, will have to be linked into the electric chain. The Astronomer Royal is particularly anxious to bring light-houses within his reach, in order to lay on true time to passing ships, a most important object. The same connecting wire would serve the purposes of the life-boat service, and also that of the meteorological office, inasmuch as the exposed points on which light-houses are generally built are sure to give good indications of approaching weather.

Any scientific scheme by which only moderate forecasts of the weather could be given, would be of incalculable advantage to the whole community. In agriculture especially, what an amazing loss we now experience for want of a knowledge of what the weather may be for the next few days. In changeable weather what millions of quarters of wheat are lost by a heavy rainfall at an inconvenient moment! The same may be said of our hay and other green crops. The time will come we feel certain, and that ere long, when the farmer will tap his glass and read the weather reports before he puts his scythe or reaping-machine in motion. The word to gather in the harvest will then really go forth from a small back office in King

Street, Westminster. From the same small room the order will go forth to the fishing-boats to proceed to gather in the harvest of the sea, and under-writers in any Exchanges in England will read with thrilling interest the weather forecasts this department of Government duly supplies them with free of charge. Frost, as well as storms of wind and rain, will presently be with certainty anticipated. We are apt to rejoice at a good frost, and we look back with regret at what we are pleased to call "good old-fashioned winters," but we rarely reflect upon the misery any long-continued fall in the temperature below freezing-point occasions to the labouring man, until we meet with them in gangs singing the doleful ditty—

"We've got no work to do, who, who," etc.

A week's notice of an atmospherical change that binds up the earth like iron and stops the work of the builder, would enable employers to arrange other work for their men, and prevent their being thrown, without any warning, upon the streets. Our present system of observation, it is true, refers almost entirely to the seaboard, and inland weather cannot be anticipated by means of the meteorological information gained therefrom, inasmuch as the inequalities of the land materially modify the results that may be anticipated from coast-line observations; but the number of wires traversing the land give us the power of minute obser-

vation, and the sum of conflicting influences will, no doubt, be made to yield a needful result the moment men set their minds to the task.

When meteorology assumes the form of a science upon which we may depend, we shall be able to dispense with many arrangements which are now required to alleviate the destructive effects of storms. We do not anticipate, it is true, a time when there will be no marine insurance offices, no life-boats, and no under-writers, but as soon as the weather is removed from the region of mere speculation and gambling, it will lose its charm for a certain class of speculators. Moreover, there will be very much less legitimate business to do; merchants will perceive that it is better to rely upon prevention than cure, to read the weather telegraph than to send their ships to sea in any weather with the chance of the under-writers making it all right. To human life, the last thing cared about by our present arrangements, let us hope that dependable weather knowledge will be a great source of security; when the approach of storms of great severity can be predicted with certainty, no doubt it will be considered an offence at law to send a ship to sea just as it is now a punishable offence to cross the line when a train is approaching. At the present time there is an average of upwards of a thousand wrecks a year upon our own coasts. A very large proportion of these, upwards of 600, take place upon the east

coast between Dungeness and Pentland Frith, and consist of ill-found rotten old colliers that go to the bottom with the first heavy gale of wind. The wreck-chart, published annually, affords frightful evidence of the amount of marine disaster which takes place upon every shore and headland of this deadly coast. Few of these shipwrecks would occur if those who navigate them were aware of the weather they would have to encounter in their short voyage, and fewer still if there were no such things as marine insurance companies, which tempt unprincipled men to send their ships to sea in an unsound condition, in many cases with the deliberate intention of losing them.

The Meteorological Office prints a daily report of weather intelligence, which they supply to any port the authorities of which apply for it. This may be all very well in places to which no telegraph runs, and the only means of obtaining meteorological information is by post ; but inasmuch as the value of these weather notices depends upon their being forwarded as soon as made, we cannot see that these printed reports are of much value.

It was unfortunate that there should have been so much guess work with respect to many of the weather forecasts of the late Admiral Fitzroy, inasmuch as it has led the present management of the Meteorological office to act perhaps with too much timidity. It was the intention of the committee of "three nominees,"

as they are absurdly called, to abolish the storm signals; indeed they were withheld for some time, and were only re-established on a very limited footing when petitions for their re-establishment were forwarded to the office by the seafaring people. As we have said, Admiral Fitzroy's system was abandoned. "The object for which these (signals) were intended, was solely to convey an intimation of the wind which was likely to blow at the station where the signal was hoisted. The object to be attained by the new signals was to convey intelligence of the wind which was blowing on a certain line of coast, and also of the locality where that wind was blowing." We cannot see that the three nominees have in this respect improved upon the old system. What the seafaring people want, is to know what wind is likely to blow at the station where the signal is hoisted; local knowledge is all that such people feel interested in. If such knowledge cannot be supplied from the London office, we do not fancy that local people will care much to know "what wind is blowing on a certain line of coast;" and elaborate semaphores, such as we are told are requisite to explain the new system, we fear will not be so well understood as the old simple signals. These semaphores are now being tested at the wharf of the elder brethren of the Trinity House, at Blackwall, at Liverpool by the Mersey Dock Board, and at

North Shields, so that we shall not have long to wait for a practical proof of their efficacy.

The working of the new system by a committee of three is, we fear, a mistake. There is no life, no energy, where there is divided authority. It would have been far better if the Board of Trade had appointed a new clerk of the weather, who would have worked out his own ideas and given vigour to the whole system. As it is, everything will doubtless be carried on by strictly scientific rules, but everything will stagnate. Committees don't invent, and in a new office of this kind, where almost everything has to be originated, there will be no element of originality, and we fear but little progress. However, the difficulty will cure itself. The sailors for whom this office is mainly established are not likely to put much faith in a humdrum committee, and the signals will, if limited to mere announcements of atmospherical disturbance, lose all hold upon their attention. There is nothing like the stimulating influence of personal superintendence in dealing with this class of men. However Admiral Fitzroy may have erred through the oversanguineness of his nature, he interested those with whom he worked, which is not likely to be the case with the "three nominees," who are known to no one, and possibly if known would prove to be wholly wanting in that dash which is so necessary in all new undertakings.

## HOW AND WHERE TOYS ARE MADE.

IN these days when a penny is the regulation price for the toys of the breaking age, when a Noah's ark, with a larger collection of animals than can be found in Wombwell's menagerie, can be purchased for that small price, my young readers may like to know where they possibly can be made. The mere wood in this country would cost the money, to say nothing of the labour, and leaving out the profit altogether.

Englishmen are too much engaged in the solid business of life to find employment for these trifles—trifles only in a manufacturing point of view, however; to children these trifles are a real matter of education as well as of pleasure. What would a nursery be without its toys? What grim old men

and sulky old women we should grow if there were no such things as toys to supply the poetry of life, and to give pleasure and excitement to the dry routine of the school-room—trifles which play with the mind before the hard toil of the world comes upon them !

Where trees can be had almost for the cutting down, there is the land where toys spring up so freely that the very poorest are enabled to enjoy them. It may be imagined that to cut out every animal and properly shape it with a knife would be quite impossible at the price. Some wholesale process of construction is devised, and that is found in the common lathe. In the woods of Germany, where the pine-trees may be had for twopence apiece, the raw material is found ; and here, where labour is cheap and divided among little children, the workmen, if we may call them so, are found—here the dim shadowy woods are changed into the laughter-giving toys, which brighten up the eyes, and make merry the hearts, of the other little children of Europe.

Let us see how ingeniously, for instance, a whole troop of horses can be produced in the course of a few minutes. A few cuts of the lathe tool turn a piece of wood into a circular form, which, upon a casual inspection, looks more like one of those rings of bread which we see in continental towns than a preparation for a toy. Upon making a section of one of these

turned rings, however, the true outline of the animal required is shown.

This circular piece of wood has only to be cut into a number of segments, and the troop is made in the rough, and the horses have only to be rounded, and the space between their legs cut out, and they become well-proportioned steeds. This work is done by little children, who also add the tails. Elephants, cows, and the whole range of four-legged animals are produced in the same mechanical manner. The lathe-man does his work almost mechanically by means of a steel model guide, which directs his tool without his even having to think of what he is doing. In the same way Noah and all his family are turned upon a single piece of wood, the feet of one touching the head of the other, and they have only to be cut off from each other to represent the family from whom the whole generation of men has sprung. These animals are roughly painted, and packed in their respective arks, and when completed cost only a halfpenny! The carriage by water to this country, through Holland, costs another farthing, and the salesman over here is content with another farthing for his profit on the sale. It is strange to think that diversely formed animals should be produced by the same means by which toy cups and saucers are made; but by the aid of an illustration the ease and speed with which it is done is apparent. Specimens of this interesting

method of toy-turning have long lain unnoticed in the collection of foreign woods in the old orangery in Kew Gardens; but the public attention to them has been drawn more pointedly by the collection of toys in the late International Exhibition. But these are toys which boys grow out of with their first suit. Military toys mainly come from France and Germany. In the former country they probably serve as a sort of elementary training to fire the war spirit of the nation. Hesse Cassel provides the suits of armour, the breastplates, cuirasses, helmets, and guns; and in Prussia are made the pretty little models of ships and other interiors, with their appropriate fittings. These are modelled of *papier mâché*, and singularly enough they are made by prisoners under penal servitude, a far better occupation than the oakum-picking and other rough labour to which our prisoners are put. The artistic manner in which they are made speaks well for the educational training given to the people in that country. In some of the German states schools are established for the purpose of giving an art education for the manufacture of toys, and many of their productions are quite elegant, and some people would think almost too good for the rough play of children. This, however, is a mistaken idea; for there can be no better method of familiarising the young with beauty of form than by putting well-formed toys into their hands. Nothing

makes such an impression upon them as their playthings; they learn what is beautiful thereby instinctively when their minds are most vivid; an education this, by the bye, which is of the utmost importance in this country where the useful has starved the appreciation of the beautiful to a lamentable degree.

Leaden toys such as soldiers in boxes also come from Prussia and Bavaria. They are cast in moulds, a whole regiment at a time, and are separated afterwards and coloured by children. From the quaint old city of Nuremberg come the metal toys, such as omnibuses, carts, and steam-vessels, brightly coloured. It seems strange that ships should come from an inland city, but boys all over the world are passionately fond of the sea, and the craft belonging to it, so that it matters little where they are made. But it is to be observed that these German models are of a very antiquated pattern. The steamships look more like Noah's arks than the trim built vessels of sea-going nations. In London a trade has sprung up which to the well-to-do abolishes the use of the boy's clasp knife in the occupation to which he most loves to put it—the cutting out of his ship model. Beautiful specimens of craft from the boat up to a three-master can now be purchased in the shops, with all the proper fittings, such as steering wheels, anchors, compasses, and in steamers even the engines to move them. In

the matter of machinery our boys are now being introduced to a new delight. There is scarcely an optician's window in town that is not supplied with model steam engines, locomotives, and fire-engines that are actually worked by steam. These can scarcely be called toys in the ordinary sense of the word ; at all events they are toys to be carefully conserved instead of broken. Beautifully constructed, they are made to take to pieces. Books of instruction are sold to teach the young engineer how to build them up, rough castings are sold in order that he may finish them, and just as military playthings are sold in France to bring up young soldiers, these beautiful models serve in England to train up young engineers,—one of the great wants of our country. We admit, however, these are specialities, and are only suitable for special minds. The implements of real play remain pretty much as they were in the days of the old boys, with the exception that they are as a rule not so roughly constructed. The old wooden hoop has given place to the iron wire hoop, the tops are now also of metal, the balls are of gutta-percha. As a rule it seems as though in the playground—with the exception of the public schools—the play is not so robust as it was in the days of the old boys ; but the athletic sports of young men on the other hand are more thorough, football is a real fight, and cricket is so fierce that the batsman has to be protected with armour. What a

capital chapter could be written upon the seasons of the different games ! By what instinct does the boy take at particular seasons to marbles and then to peg-tops or rounders ? But this is a part of the subject which we have not time to follow out ; moreover, we have said enough of the toys of the boys, and now a word for the girls. We visited the other day the manufactory of the largest doll-maker in England—Mr. Edwards, of the Waterloo Road—from whose establishment issue for the nurseries of the United Kingdom 20,000 dolls weekly. We are not a great toy-making nation it is true, but we admittedly beat the whole world in dolls. Those who remember the day when the wooden doll with its flagrant red cheeks and black dots of staring eyes was the type with which young girls were contented, would scarcely recognize the artistic models all in wax that can now be purchased at a moderate price. They are cast in moulds down to the feet with the delicacy of statuary art, the softly mottled and dimpled arms, the childish innocence of the faces, the eyes swept with fine lashes, and the hair real and elaborately arranged. A very curious sight it was to see a room full of young girls putting the hair upon the waxen scalps. With a knife slightly heated a cut is made, and three or four hairs are inserted in a row ; this process is carried on until the bald pate is covered with flowing locks, which are so firmly fixed that they will bear combing and brush-

ing without falling out. To watch the different coiffures being made, the room looked more like a barber's shop than anything else. But more singular it was to see the milliner's room, for the high-class dolls all have a proper wardrobe, each article being nicely fitted, so that it can be taken off and put on—the fitting and cutting out of silks and fancy stuffs, the hats and bonnets that were being arranged—it seemed as though the Court milliners of Lilliput were hard at it preparing for a State Ball. The French, although they do not make such good dolls as we do, surpass us in dressing them. They do not dress them as we do, but as women, hence their toilet is far more elaborate, and in the latest style of fashion; and in Paris, patterns in paper of ball dresses for dolls are sold as a part of the wardrobe, by which children may cut them out and make them themselves—a real instruction in a very necessary art, which possibly goes some way towards the tasteful dressing of the people in after life. But to return to these model dolls to which we have been referring: they are sold with all the requisites of the toilet-table, combs and brushes, tooth-brushes, puffs, looking-glasses; in fact, a modern doll to be properly dressed will take a young lady a full hour's employment,—who shall say that after thus practising they will require the attention of ladies' maids for themselves? Imagine, my fair little reader, a doll with such a fine toilet and trousseau as to cost

£50 !—the price of a beautiful princess in wax at a leading West-end establishment.

But dolls are of as many different stations, as children in real life. There is the paper doll dipped in wax, a sort of middle-class doll, warranted to wear well; then there is the composition doll, made of *papier mâché*, with a thorough German physiognomy; the rag doll for real babies to bang about, and the common Dutch doll, mainly used for the delectation of babies of a larger growth on Derby days. Then there is the abominable gutta-percha doll, which never wears out—a perfect pest to a real child, who likes to watch a doll's progress, even towards decay.

It seems as though, having arrived at perfection of finish, the doll-makers are now striving to give them animation and speech. For a shilling they can now be purchased to run along the floor, and, for a little more, to say “papa,” and “mamma,”—whilst opening and shutting the eyes is a common accomplishment.

## DEALERS IN SHAMS.

AMONG the more curious frauds of the present day we may note the cunning manoeuvres of those who prey upon collectors of antiquities and rarities in art, etc. Ever a credulous race, they lay themselves open to a certain class of villains, who prey upon them in the most subtle manner. There are forgers and forgers. The man who imitates a bank-note keeps to that line, and never dreams of imitating old manuscripts, etc. In fact, different collectors of curious or rare things are all infested by special knaves who prey upon their credulity, just as special roses are infested by their own peculiar aphid blight. The higher the art, the more peculiar and rare is the art education necessary to ensure a colourable imitation. Hence fraudulent fabricators of highly-prized treasures keep to their own walk.

Among the most gullible of the class termed collectors, we may perhaps rank the antiquary. So much is left to the imagination, that those who prey upon them have a wide margin in which to move. There is a notable saying that seeing is believing, and if a man with his own eyes sees some curious antiquity dug out of the earth, it is difficult to make him believe that it is other than a genuine article. A considerable class of cunning fellows take advantage of this sort of belief. No sooner is any great excavation about to be made in the neighbourhood of the metropolis than they begin to lay their snares for the unwary. If there is any probability that Roman remains are likely to be found, they take care that the expectations of the curious shall not be disappointed. Long before the first spit of earth has been lifted by the navy, they have searched the dealers' shops for old coins, old swords, or daggers, which after being treated with acid are sufficiently rusted and eaten away to imitate the tooth of time. Provided with these precious relics, they proceed to the scene of operations, and at once enter into an arrangement with the navy. The relics are entrusted to him, and no sooner does he see one of the collecting fraternity—they are known with unerring instinct—than they are tossed up fresh from the ground, and offered to the collector with a simplicity which is quite delightful. The eagerness of the true antiquary leads him to seize upon the treasure with

impetuosity, for fear a brother may snatch it from his grasp ; hence large sums are often in this manner paid for articles which, upon examination, turn out to be base fabrications. When the dock was being dug at Shadwell some years ago, two of these cunning fabricators of relics made a good harvest out of the occasion, by casting a number of "pilgrim's signs," as they termed them—certain emblems in lead, which, it was asserted, had been used by pilgrims in remembrance of having visited certain shrines in the pre-Reformation times. These relics were made in the rudest manner, and got up so artfully that they were purchased by the trade collectors, and some of them were even disposed of to the British Museum, but the fraud was found out before they were exhibited. Only very lately certain old-fashioned-looking pipes have been dredged out of the Thames, and have appeared in the windows of the trading collectors, and even in one of the London museums, under the name of "Deadmen's pipes." The theory is that they were used by those who buried the dead during the year of the great plague ; but how they got into the Thames is a question, unless the bodies were conveyed by water, and these pipes were thrown in by the bargemen. Such pipes are constantly being found in the mud collected from the river in the neighbourhood of Chiswick to this day. How they could have got up stream, some eight miles from the London of the plague year, is a

marvel. It has been reported that a society is about to dredge the Tiber, with a certainty of discovering invaluable treasures of Old Rome. If the scheme ever comes to anything, we may safely anticipate that all the sham antiquity manufacturers of Europe will make a fine harvest out of the adventure, and the world will be flooded with spurious coins, statues, and ancient works of art in the precious metals. Of late years, since evidences of the antiquity of man have been sought for by scientific students, a special aphis has sprung up to meet the fleeting want, which has pushed its cunning beak into the Stone Age and taken in a number of clever people. Flint Jack, as he was called, knew full well that flint instruments and arrow-heads, if well manufactured, cannot, by any device, be distinguished from those that are found in ancient barrows, where they had been deposited during the Stone Age 2000 years B.C. This clever vagabond would possibly never have been found out, and would have gone on puzzling the scientific inquirers into the age of the human race, had he not inadvertently stuck on with a little alum a chip of flint that had been broken off an arrow-head in course of manufacture. Upon the relic, however, being cleaned in warm water, the chip fell off and the cheat was discovered. When he was found out he had the hardihood to show the manner in which he manufactured these celts with a bent iron rod, a bradawl, and a hammer. But Flint

Jack went in for British pottery, got up the assimilations and lettering, and imposed specimens of his work upon some of the provincial museums, where perhaps they remain to this day. We trust that Shrewsbury, where so many remnants of the ancient Uriconium are exhibited, contains none of his spurious handicraft. As the British Museum is supposed to be the fitting resting-place of all remarkable antiquities, it follows that anything that is dug up or discovered, forthwith finds its way thither. Here, however, they are up to the dodges of cunning bipeds upon their victims, and every day they have to refuse marvellous specimens of antiquity which are quite unique in the eyes of their possessors, but to those of the initiated are fresh from the mint of the cunning fabricators.

In literature since the days of Chatterton we have been tolerably free from the fabricators of ancient deeds and poems. The reason of this is the certainty of discovery. Literary men are too many for those who undertake this species of swindling; it is far different, however, with art. Old portraits in any number can now be made to order. The very oak panels on which they are painted are worm-eaten by machinery, dark varnishes give the gloom of age, and many a warranted old master, if curiously cleaned of its ancient picture, would discover some modern daub underneath. But age or youth is alike to the class of artists who condescend to this kind of fraud. Certain

modern painters, whose works command high prices, are copied almost on a manufacturing scale, and sent into the market, especially to auction rooms, for sale. There are two painters in particular whom these cunning imitators imagine to be comparatively easy of being copied, Turner and Müller. The correct perspective of the former, the splendid atmosphere in his wild sunsets, these knaves imagine to be fairly within their scope, and sketches by Turner in his last manner are continually meeting the eye in small picture-dealers' shops, whose whole stock in trade would not reach the price of a single sketch of the great master. The solidity and breadth of Müller again is imitated by plastering paint on the canvas as though it were done with a trowel instead of a brush. Sir Joshuas again are continually met with warranted genuine, with the paint scarcely dry upon them. But where shall we end if we attempt to follow to earth the cunning bipeds who make their living by preying upon the credulity of others? Do we not all imitate in our various vocations the manner of the leaders of our art? Do we not often cheat even ourselves into believing that we are originators of ideas, whereas but too often we only reflect those of the last clever person with whom we have come in contact?

## SKELETONS AND THE SKELETON TRADE.

It is but rarely any of us come across a skeleton, and when we do, what a shudder passes through us! Although nothing more than a framework which upholds the man, yet poets and painters have depicted this cage of bone with its dangling extremities as the emblem of death itself—the King of Terrors, whose dart we all unavailingly attempt to dodge. So ingrained is our terror of this “rough sketch of man,” that the idea has become imbedded metaphorically in the language, in the form of that “skeleton in the cupboard” which is to be found in every household. It is, we suppose, the rarity of the spectacle that gives such mysterious terror to us when we see it in the reality.

But, as we all know, familiarity breeds contempt. Those who are brought into every-day contact with the

grim stranger very speedily begin to look upon him as a grotesque sketch, and the medical student—the most irreverent dog in creation—sets a pipe in its mouth in the dissecting-room as a capital joke. But the reader may ask, Where do all the skeletons come from that are to be found in the anatomical schools of the world? The days of Burke and Hare have gone by; bodies for dissection are not procured by means of a pitch plaster. Nevertheless, there is no lack of skeletons, and human bones for anatomical demonstration can be procured in any number. Paris is the skeleton market for the whole world. The method of their preparation is ghastly enough to satisfy even the pencil of Gustave Doré, and we are only surprised that he has overlooked it. In the suburbs of that city a great tank is provided, in which all the human bodies that can be accumulated from any quarter are placed, and here, by the aid of chloride of lime, they are allowed to decay, until the skeletons appear clear of all incumbrances and ready for the manufacturer, for art has much to accomplish ere the raw material nature furnishes is fit for the market. Into this tank are placed all the unclaimed bodies from the Morgue; poor victims of despair who have ended their sufferings in the dark water. Possibly during the late siege and assault there was a large supply from other sources; at all events, there is always a sufficient quantity for the medical schools of the two hemispheres. When cleared by long maceration of

unnecessary incumbrances, the process of manufacture begins. The get-up of a skeleton is a matter of great skill. No clear starcher employs more delicate art to turn her fine linen with greater nicety. The bones must be of faultless whiteness; the articulation of the joints constructed with the greatest accuracy; so that the skeleton may be capable of being posed so as to remain in any attitude when once placed. All this entails some expense, and a good specimen costs at least ten pounds; and yet, possibly, the owner died from the want of a bit of bread, never dreaming that he contained within himself what to him would have appeared the riches of Croesus. At the beginning of the medical session there is a great demand for skeletons or bones for the young Sawbones in the schools, and the dealers in these articles puff their wares through the press with a creditable eagerness. The poor owners never whilst in the life were aware of their full commercial value. But skeletons, like other articles, are of different sorts and sizes, and therefore differ mightily in their cost. An ordinary specimen, as we have said, may be obtained for £10, but the price rises immediately anything extraordinary comes into the market. In the College of Surgeons, for instance, where the largest number of skeletons in the world is to be found, ranging from that of a delicate leaf through the whole course of creation up to man himself, there are some extraordinary skeletons which

illustrate the point in question. Giants, as may be supposed, demand their price, but we question if ever one was so costly as that of O'Brien, the Irish giant, in this Museum. John Hunter had long had his eye on this Goliath, and as O'Brien knew it, he was in mortal dread that his remains would fall into the great anatomist's hands. Consequently, when he was dying he arranged that his remains should be taken out to sea, and there sunk fathoms deep. But Hunter was determined that such a splendid and almost unique skeleton should not escape him. He therefore attempted to bribe the persons provided to watch the body until it was dropped into the ocean, by the offer of a hundred pounds. He was too eager, however, and they ran it up to £800—the largest sum, we suppose, ever given for a body. Having obtained it, and fearing lest it should be claimed by the giant's relatives, he had it sent home in his carriage, when he immediately dismembered and boiled it down. At his leisure the skeleton was set up again, and it may now be seen towering by the head and shoulders over adjoining skeletons in the same glass case in the Museum in Lincoln's Inn Fields.

It may not be so easy to buy a dead body in the present day, nevertheless there are certain remarkable examples of misformed humanity about town that, we fancy, may not escape the *post-mortem* attentions of certain enthusiasts of science—

we all know the length such gentlemen will go in procuring rare specimens for collecting. Close to O'Brien's there is another sturdy, thick-set skeleton which will attract even more attention on the part of the public. It is not often that we leave cards behind us after our death, but in this case it was otherwise. It is in the shape of a coffin-plate, with the name Mr. Jonathan Wild, died May 24th, 1725. The address, from motives of delicacy, is left out; but it will be sufficient to say it was Tyburn where that astute thief-catcher was hung. Freeman, the American pugilist, is not far off; but, unfortunately for the fame of his country, he is by no means so big as his brother giant. In the adjoining glass cases are specimens of African and Australian skeletons, in which the comparative anatomist sees great differences from the European type. Not far off are to be seen skeletons of the chimpanzee and the gorilla, in a half-crouching, half-stooping position, seemingly lifting themselves by slow degrees to the erect standard of man. Those who are fond of speculating upon mysteries, will find food in a skeleton of a young lad, the history of which is comprised in the fact that it was found standing up in a vault of St. Botolph's, Aldgate, old church, with remnants of clothes on it, in the year 1742. The last time the vault had been opened previously was during the year of the great plague in 1665, and the probability is that during an inter-

ment, he must have been fastened down in the vault by some oversight of the workmen—to take the most charitable view of what otherwise may appear a hint at a dark tragedy.

There are other skeletons in this museum which prove to us that Nature is not always exact in following the pattern she has set before herself. For instance, some of them have extra ribs, a qualification of no especial benefit to the possessor during life, but giving *post-mortem* value to his bones, as the cost of these irregular skeletons is thereby enhanced. In the pathological portion of the museum some specimens are seen which fill us with astonishment—so strange are the contortions to which disease reduces “the rough sketch of man,” as Hood not inappropriately calls the human skeleton. In some instances the bones are twisted together in a confused knot, in others they are so diverted from the original plan, that we can only wonder how their owners managed to carry on life under such disadvantageous circumstances.

In conclusion, we may remark that with regard to the commercial value of skeletons of an ordinary character, that they do not seem to be affected by the ordinary rules of demand and supply. If cotton goes up in the market, we know how the manufactured fabric rises in price immediately, and when it goes down that there is a proportion-

ate fall; but notwithstanding the immense loss of life in the siege of Paris, and in the war generally, when we know that the pavements of that city were underlaid with the dead, yet skeletons are just as costly as ever, and we suppose will remain so.

## LIFEBOATS, AND THOSE WHO MAN THEM.

As the winter comes on, and, lying in our beds, we hear the wind roaring without, there are few of us, especially if we hail from any seaport, who can help thinking of what a wild night it must be at sea, and of the possible tragedies that are being enacted on the mad waters around our coasts. In a former volume on 'Wrecks and Wreckers,' we gave at some length the causes of these losses at sea, and we glanced at the noble exertions made to save life by means of the lifeboats so plentifully planted on every dangerous spot around our shores. The exertions of the Royal National Lifeboat Institution, however, demand at our hands a more elaborate account than can be given in a mere paragraph. The heroic deeds performed by these hardy mariners remind us that the days of chivalry are by no means past. Indeed, we

question if in the days of old anything like such real dangers were encountered as our lifeboat crews are exposed to night by night during the autumn months, and which they conquer without imagining that they are doing anything at all out of their ordinary way. Moreover, self-consciousness is one of the last things we should debit the hardy seamen along our coasts with possessing.

Although the lifeboat association has only been in existence eighteen years, lifeboats have been known for a much longer period ; the boat made by Great-head of Shields was doing work as long back as the year 1790. This craft was peculiar in form, being much curved at prow and stern. It had air cases at the sides, and was on the whole a very trustworthy boat. But in course of time this model was departed from, and others were made that possessed no self-righting qualities. In the early part of the century the name lifeboat became a byword and a reproach, inasmuch as several of them, whilst proceeding to the rescue, turned right over and drowned their crews beneath them. As late as 1850, the Shields lifeboat was thus upset, and drowned twenty-two out of the twenty-four pilots that manned her.

This terrible disaster moved the late Duke of Northumberland, who always felt a strong interest in the maritime population, to offer a premium for the construction of a new lifeboat which should possess

equally good qualities as a sailing and a rowing boat. The model that won the prize was constructed on lines agreed upon by several individuals, but the chief credit was due to Mr. Peake, of the Royal Dockyard, Woolwich. This boat is really a scientific triumph, and it has served as the model upon which all subsequent boats for the rescue of life have been constructed. It has a moderate share of gunwale, the stem and the stern being covered in to prevent the shipping of heavy seas. The extreme length is thirty-three feet, and her breadth eight feet. She is fitted with six relieving tubes six inches in diameter, filled with self-acting valves, to let the water out and prevent its returning. The air-chambers are fitted into the sides of the boat and into the two ends. The ballast is composed of solid blocks of cork, and an iron keel running the whole length of the boat, and weighing nine hundredweight. Around the outside of the boat and near the water-line are festoons of chains to which persons in the water may cling; two deeper stirrups of chain being attached to the midship section to enable persons to climb into the boat.

This lifeboat, thus constructed, is almost absolutely safe in any weather. It possesses great lateral stability, great speed against a heavy sea, first-rate self-righting powers, and facilities for discharging immediately any amount of water she may accidentally ship. Her capacity allows of the stowage of a large

number of rescued persons, as many as eighteen or twenty having been taken off vessels without any great inconvenience to the crew. The hardy fellows who man her have the most implicit confidence in her safety. In driving through a heavy sea, she often ships tons of water in a minute, great waves falling on the backs of the oarsmen and passing off by the relieving valves almost as soon as they come on board. The self-righting power of the boat has never failed. On two occasions, when struck by a tremendous sea, she has been turned right over on end, and come up again quite dry. Two men, who were clever enough to see the coming catastrophe, and stowed themselves under the thwarts, rose with her without a drop of water touching their clothes. The men, in case of such mishaps as these, speedily clamber into the boat again by the life-lines when they have been thrown out, their cork jackets preventing them sinking. In many cases holes have been made in the bottom of the boat, but by means of her air-cases and cork she has yet floated; persevered with her work, and rescued the crew she has gone to save.

In 1858 a rescue was effected at Youghal under these untoward circumstances, a hole as big as a man's head being knocked in the bottom of the boat, and all her timbers shaken; nevertheless, the noble fellows took fourteen men off the wreck she was making for, and brought them safely to shore. It is

but rarely that any of the crews of a well-constructed lifeboat are drowned, and when they are it has generally been through their jumping upon the shipwrecked vessel, or in consequence of being crushed between the boat and the ship. The association was congratulating itself upon the absence of any casualty whilst the men were on board, when the melancholy news came that the Padstow lifeboat, whilst proceeding to the aid of the 'Georgiana, of Boston, wrecked on the Doom bar, upset, and before the crew could regain the boat, which immediately righted herself, five of them were swept away by the surf,—an accident this for which the lifeboat was by no means accountable.

Of these splendid boats, at the end of the first half of the present year, one hundred and seventy-four were stationed around the coasts of the three kingdoms. Wherever the dismal black dots which mark the sites of wrecks upon the Wreck Chart appear, there may be seen the red mark indicative of a lifeboat station. A boat, together with her equipments and boat-house, costs five hundred and eighty pounds, and there can be no greater proof of the sympathy the public feel with our sailors whilst pursuing their perilous occupation, than the rapidity with which this sum is subscribed when it is intimated that there is a want of a boat at any exposed part of the coast. No one knows better than seafaring men the alacrity with

which the sum necessary for the purchase of a boat is made up; an appeal to the readers of the *Quiver* newspaper, for instance, having been speedily responded to, nearly two thousand pounds having been subscribed, and three 'Quiver' Lifeboats are now on the coast ready to do good service whenever called upon. The national sentiment is at all times evoked with enthusiasm when these calls upon it are made. In many instances boats have been the gifts of individuals, presented as messengers of mercy for some mercy received. Four-and-twenty years ago the institution began with one boat; it now possesses a fleet, the gift of the public, and an income which is princely; but it requires the constant aid of the charitable to keep the glorious machinery of the association in an efficient condition.

Besides the lifeboats of the institution, there are still some of the old Greathead boats remaining in the north, and the Norfolk and Suffolk sailing boats. These splendid boats are of good size, being forty-six feet long and twelve feet wide. They spread a large amount of canvas, and are very stable, being ballasted with five and three-quarter tons of water, which lies quite open in a trough twenty feet long, four feet wide, and two and a half feet deep. Thus heavily ballasted, these boats do not lift to the sea, but cut through it. They ship large quantities of water, but that which is superfluous runs off. The crews are pro-

tected from being washed out of them by ridge ropes, which run through iron stanchions fixed round the gunwale. These splendid boats go out in any weather, and the utmost confidence is placed in them by their crews.

An occasional terrible disaster, however, shows that their confidence is not well founded. Such was the accident to the Gorleston lifeboat some years since. This boat had rescued seventeen of the crew of a brig, and was returning, when a fishing-lugger struck her, and she capsized. Most of the crew of the wrecked vessel, as well as of the lifeboat, in all twenty-six men, were drowned. Had this been one of the institution's self-righting boats, this accident, it may safely be said, would not have occurred.

To return, however, to the lifeboat proper. These boats often have to be transferred for some distance in order to get a good offing. For this purpose they are all provided with a travelling-carriage. It is lawful for any coast-guardsman or constable to seize any number of horses that may be required for this purpose. The boat starts upon her land journey with her crew seated in her, and, as may be supposed, surrounded by an excited crowd. The launches always are exciting affairs. The boat is sent on her mission at once from the carriage, the launching tackle being fastened to the stern-sheets of the boat. The excited crowd, on such an occasion, pulling at the ropes, and

sending forth the gallant boat upon her errand of mercy, would make a grand picture, which some artist should put upon the canvas.

These lifeboat services are often of a most desperate character, and the adventures the crews go through seem almost incredible. For instance, on February 2nd, 1862, the bark 'Guyana,' of Glasgow, went ashore on some rocks off Greenore Point, county Wexford. The Carnsore lifeboat was immediately called upon, and started for the wreck, nine miles distant. Upon arriving at the cliff overlooking the wreck she had to be lowered down eighty feet. She was then launched through the surf, and proceeded to the wreck. On arriving near the vessel, however, the force of the wind, tide, and sea was found to be so great that it seemed to be impossible to reach her; the boat was therefore anchored for awhile, to rest the crew. A second attempt was then made, with no better success. A third time, some of the oars being double-manned, the boat proceeded, and, rowing to the windward of the wreck, cast anchor, veered down to her, and saved the whole crew, numbering nineteen hands.

Perhaps there never was a nobler case of rescue than that performed on the 3rd of December, 1863, by the crew of the Ramsgate lifeboat, when, without getting out of their boat, in company with the aid tug-boat, she saved the crews of two noble vessels. The

first vessel she was called to was the 'Fusileer,' an emigrant ship bound for Melbourne. The coxswain, in his report, says,—“We shouted to those on board to first save the women and children, of whom there were a great number. The scene at this time was an appalling one; the howling of the wind, mingled with the shrieks of the women and the rush of the waves against the sides of the ill-fated ship, used as we are to similar sights, made us doubly anxious for the safety of those whom by God's providence we had come to rescue.” No sooner had the crew and emigrants in this vessel been safely landed by them in the tug, when they heard that another ship was ashore on her beam-ends on the “Shingles.” The crossing the sands to this new wreck was a work of the utmost danger, the lifeboat every now and then scraping the ground, and whirling round with the greatest velocity. Bumping and tossing through the broken water, every minute shipping tons, which fell upon the backs of the crew, the boat at length came alongside the 'Demerara,' a ship of Greenock. The crew, eighteen in number, were taken off in a most exhausted state; and the noble lifeboat, after a service of sixteen hours without intermission, returned to port, having that night saved one hundred and twenty souls from a watery grave.

It seems nothing less than miraculous that the crew should have been able to encounter such extraordinary

fatigue, but excitement at such times gives superhuman endurance. The skilful rescues we have mentioned are but examples on a large scale of brilliant episodes that are being performed all round our rocky coasts during bad weather.

The advent of a storm is generally known to the old salts by means of the weather signs upon which they place so much dependence. The National Lifeboat Institution supplies standard barometers to the different stations, together with a little manual which enables the men to read them. But much more to the liking of this class of men are the weather signs, which they put more confidence in than they can be taught to do in the mercurial column.

Some of these signs of the coming weather are worth being remembered by all.

When the evening is clear, with a rosy sky at sunset, fine weather may be expected. When the sky is red in the morning, much wind and bad weather may be expected. When the sky is grey in the morning, fine weather may be expected. After a long spell of fine weather, the first signs of a break-up are light streaks, wisps, etc., or mottled patches of distant clouds. As this coming overcast aspect appears more or less oily or watery, so wind or rain may be expected. The flight of birds, also, gives unerring signs of the coming weather. When they fly out to sea early, fair weather may be expected. When, on the other

hand, they hang over the land, or fly inward, it may be surmised that a gale of wind is not far off. Again, great clearness of the atmosphere near the horizon, when distant hills appear to be remarkably near, and what is called a good hearing day, are signs of coming wind and rain. There is a well-known rhyme published in this manual which tends to impress these signs on the memory :—

“Fast rise after very low,  
Indicates a strong blow ;  
Long foretold, long last ;  
Short notice, soon past.”

As long as the late lamented Admiral Fitzroy was alive and the Meteorological Office of the Admiralty was in full force, coming bad weather, gathered from indicators showing themselves at the different ports around the coasts, was telegraphed back to them again in a more distinct form. The storm signals, consisting of three cones elevated on a mast, warned the mariner of the approach of a storm. These useful signals, were discontinued for a time after the Admiral's death, but we are glad to hear that the Admiralty have decided to establish them again. They are worked by the coast-guard, and the combination of the cones is so arranged as to show the direction from which the gale may be expected. Thus, a gale from the northward is indicated by a single cone pointing upwards ; a gale from the south with its apex pointing down-

wards. A gale from opposite quarters is signalled by means of a round drum ; dangerous winds from the north-west are indicated by a cone uppermost, and a drum undermost ; wild winds from the south-westward, on the other hand, are signalled by the drum being uppermost and the cone, with its apex downward, being placed beneath.

There are night-signals with lamps on the same principle. By means of this machinery the old mariners hanging about the pier-heads and the coast-guard stations, are often startled by the running up to the flag-post of the storm signal, and then but too often, especially on the east coast, a rocket climbs the sky, and they know that for that night their work is cut out for them on the stormy ocean, and we all know how well they do it. That some higher motive than mere gain moves these gallant fellows to these desperate adventures we may be certain, as a couple of sovereigns—the fee a physician takes for a five minutes' consultation—is all the pay each man gets for a night's work, during which he holds his life in his hand.

## RATS AND THEIR DOINGS.

### ABOVE-GROUND AND BELOW.

THE little animal we so rarely see—unless it be at the Zoological Gardens, where a certain number of rats are given weekly to the eagles—is much nearer to us than we imagine. If we happen to live in an old house, especially if it is near an hotel or an eating-house, we may be pretty sure that they are beneath us and around us—beneath us in the sewers doing one great service, consuming the grease and fat that escapes from the drains. If it were not for these little scavengers, the house drains would be speedily stopped up by this kitchen refuse, which, escaping with the washing-up water, accumulates and hardens in the drain-pipes in a manner so rapid that it would not be believed unless it were seen. From the drains, especially when they are constructed of brick, they

make their way into the house, making channels in the walls, and working their way along skirting-boards and under floors. The great hunting-ground for rats is, however, the sewer. Here they grow to an enormous size, and attain a fierceness that few dogs care to face. Nevertheless, the great hunter, man, is too much for them, and it will interest our readers to know that there is a class of men in the metropolis who make their living by drawing these preserves, if we may use a sporting term. The method of hunting them adopted, is as follows:—Several ratcatchers will agree to beat along the main sewers towards some common centre, just, in fact, as gamekeepers would do at a battue. The hunters always go in pairs carrying a light with a tin reflector, and a bag. The rats are very terrified with the light, and immediately upon seeing it try to escape. They cannot run as fast as the man, however, as they have to keep along the side of the sewer just above the water-line, where it is very slippery; consequently the man soon comes up with them, seizes them at the back of the head, and deposits them in his bag. A ratcatcher, if he has any luck, makes more than the poacher who goes after hares, for in London he can always get three shilling a dozen for them from the dog-fanciers, who are always wanting them to exercise their ratting dogs. In Paris they have a grand hunt in the sewers once a year, when immense numbers are killed. We hear

that their skins are valuable on account of the exceeding delicacy of the fur, which is used for purses, cigar-cases, and like purposes. The hide itself is also utilized for making the thumbs of gloves, for which its elasticity makes it especially valuable. We are told that, now the glazed pipes are displacing the old brick drains, it is very difficult for the rats to retain their footing, such is the force of the contracted channel of the new drains. In case of great rains, indeed, the rats are swept out of them with a great rush, and are finally hurried out into the Thames, where they are either drowned or make again for land. Many of them creep along the mooring chains, and so get aboard vessels. The sailors, knowing their liability to be invaded by rats, block up the hawser holes, through which they generally enter. This plan circumvents them; but they are always to be found on ship-board, and especially in sugar and tallow ships, where food is plentiful. There used to be a grand scene in the days of the old East India Company, on the arrival of an Indiaman, for the ratcatcher to the Company always used to have a field-day with them, and the destruction was tremendous.

There are two kinds of rats among us—the grey Norway rat, an enormous fellow, which is usually found in the sewers, and the smaller black rat, said to be the original rat of the country. This delicate little fellow is, however, now very scarce, having been de-

stroyed by his grey brother. There are still some of these aborigines living in colonies, we are told, in the Whitechapel sugar refineries, and they vigorously hold their own against the invasion of the grey rat, which dares not face them in their stronghold, acting as they do in masses against the common enemy. Rats will always locate themselves near water, without which they cannot live long. When on board ship they are sometimes hard put to it for this necessary, and have been known to ascend the shrouds during night, in order to seek the rain that may be lying in the creases of the sails. Their ears speedily detect the sound of running fluid, and sometimes they make mistakes which are very ludicrous, publicans often finding that they have gnawed holes in the metal tubes leading from the spirit stores to the tap. We should like to watch the effect of the strong jet of spirit which rewarded their labours, not that rats are teetotallers by any means, for we are told that they will drink themselves dead drunk from the spirit casks whenever they can get an opportunity. It seems difficult to believe entirely in some of the extraordinary tales that are told of the ingenuity of the rat whilst in the pursuit of food. It is said that they will extract the oil from the long-necked Florence flasks, by dipping their tails into the bottle, and this they will do over and over again until they have entirely emptied it. They will carry eggs, again, from the

bottom to the top of a house, one rat pushing on its hind legs and another lifting with its fore paws. It will attack young chickens, and fight the mother for her own brood when hard pressed. Any person may assure himself of its poaching practices by noticing the construction of the wire-fencing around the duck-ponds at the Zoological Gardens. Half-way up it may have been observed there is a barrel of wire which is incomplete on the under side. The rat finds he cannot climb round this sharp curve and gives it up, but tries again, burrowing under the fence, and the authorities are obliged to counterplot by filling up the soil with concrete. There is a perpetual battle always going on with this little thief in the gardens, and were it not for the terriers with which they are hunted, they would speedily take a large percentage of the food of the animals.

The water-rat differs totally from the land-rat; the fur of the latter is calculated to keep out the water, consequently it is much longer than that of the land-rat, and its tail is much shorter. The shape of the head is much more like that of the beaver than of the land-rat; it is, moreover, a vegetable feeder, living upon the water-grasses, and now and then making incursions into gardens, where it attacks the various roots and beans, and, in the season, makes free with the fruit. The land-rat is also a desperate depredator among the grain, as we see by the devices taken to

keep it out of wheat-ricks, which are not always successful. Even the growing corn is not allowed to escape, as they nibble off the ears and take them to their winter stores, which are often found to be filled in anticipation of the coming winter. The rat is for ever gnawing, an occupation which, to the ordinary observer, appears to be quite purposeless, or, at best, a sign of its destructive nature. But naturalists tell us another story. It appears that this gnawing is but the means the animal takes to sharpen and wear down its four incisor teeth. These are for ever growing up from the root, and were the creature not to wear them down as they arise, they would increase to such a length as to penetrate the opposing jaw. There is a preparation in the Museum of the Royal College of Surgeons which illustrates this fact. It is the incisor tooth of a rat, which, from the cause above mentioned has increased its growth upwards to such a degree that it has formed a complete circle and a segment of another; the diameter of it is about large enough to admit a good-sized thumb. It is accompanied by the following memorandum, addressed by a Spanish priest to Sir J. Banks, who presented it to the Museum:—"I send you an extraordinary tooth of a rat. Believe me, it was found in the Nazareth Garden (to which order I belong). I was present when the animal was killed, and took the tooth; I know not its virtues, nor have the natives discovered them."

The rat is omnipresent: it is as well known in every quarter of the globe as the common house-fly; wherever food is, there it is certainly to be found. That it performs some useful purpose in the world's economy cannot be doubted—it clears away refuse that would otherwise create a nuisance; but it is also certain that it destroys a great deal of food, and spoils more. For this reason it has no friends, and it is most remorselessly hunted to death wherever it is to be found. At Bangkok, the capital of Siam, they keep rats in the house, thoroughly tame, which act as cats, keeping at a distance any of its kind that may venture to intrude. These tame rats are pretty nearly as big as young cats, and they are so domesticated, that they climb up their masters' knees and are petted, just as though they were some favourite dog. In Germany they sometimes tame a rat, and hang a bell about its neck, a plan that effectively drives away all other rats on the premises, which naturally feel astonished at such a strange ornament upon one of their own kind. By no means should it ever be attempted to get rid of rats by poison, for they creep away to die in the walls or behind wainscoting, and the consequence is that an intolerable smell is the consequence; or they will try to quench their thirst by drinking water or milk, into which, in their agony, they vomit, and the consequence is that they leave the poison behind them, to the destruc-

tion of other creatures that come and drink after them.

The ratcatcher is the most effective instrument of extermination when once rats have made a lodgment in any house. But prevention is better than cure. Wherever large stores of food are kept it is necessary to place them in a state of defence against this persevering enemy, which is ever on the watch to find an entrance; for, one only, fairly in, all the rats of London, or the neighbourhood at least, by some mysterious freemasonry known to rat nature, are speedily informed of the fact, and make for the promised land. The bonded wheat warehouses on the Thames are plated inside the floors with sheet iron; even the doors are covered with a like armour, and the foundations are solidly concreted and filled with pounded glass, for nothing less solid and unpleasant will stay the invading army that is for ever on the watch to sap and mine into the fortress. We have said that the Zoological Gardens is a pleasant land for rats. The quantity of food always on the floors of the animals' dens is a temptation they cannot resist. Rats and mice may be seen any day quietly feeding in the dens of the larger carnivora. The gorged lion lifts up its sleepy eye, but is far too magnanimous to interfere with the tiny partaker of its meal. Who knows? it may fancy, like its brother in the toils, that it is not too little to do it a good turn

yet? But night time is the field-day, if I may so speak, for the rats. They swim across the canal, and reign here supreme, and in the darkness there are a very much larger number of animals in the gardens than the Society know anything about.

The fecundity of rats is extraordinary; they begin to litter as early as six months old, and they go on for some time having four litters a year, the average number of each litter being eight. A little calculation will show that in a very few years where food is plentiful and no destructive agency is at work, they would increase to millions; hence we see the necessity for the preventive check, in the shape of the hunting instinct which, from man downward, marks the rat for its prey. But, when driven hard, the little fellow can make a good fight for it, and give as good as it gets. Mr. Jesse tells a tale of a fight between a ferret and a rat, which proves that he can reason and manœuvre for the best fighting ground as well as any general. A gentleman, he tells us, on one occasion turned a ferret and a good-sized rat into an empty room with but one window. "Immediately upon being liberated the rat ran round the room as if searching for an exit. Not finding any means of escape he uttered a piercing shriek, and with the most prompt decision took up his station directly under the light, thus gaining over his adversary (to use the language of the duellist) the advantage of the sun. The ferret

now erected its head, sniffed about, and began fearlessly to push its way towards the spot where the scent of the game was the strongest, facing the light in full front, and preparing itself with avidity to seize its prey; no sooner, however, had it approached within two feet of the watchful enemy, than the rat again uttering a loud cry, rushed at the ferret with violence, and inflicted a severe wound upon the head and neck, which was soon shown by the blood which flowed from it. The ferret seemed astonished at the attack, and retreated with evident discomfiture, while the rat, instead of following up the advantage it had gained, instantly withdrew to its former station under the window. The ferret soon recovered the shock it had sustained, and erecting its head once more took the field. This second rencontre was in all its progress and results an exact repetition of the former—with the exception that in the rush of the rat to the conflict, the ferret appeared to be more collected, and evidently showed an inclination to get a firm hold of its enemy; the strength of the rat, however, was very great, and it again succeeded, not only in avoiding the deadly embrace of the ferret, but also in inflicting another severe wound upon its head and neck." For two hours the attack and defence went on evidently to the advantage of the rat, when the gentleman determined to see what would be the result of turning the latter from its vantage-ground. The

consequence was that the rat lost confidence, which the ferret gained, and the latter speedily mastered it, not without being bitten to shreds in the encounter, over the head and muzzle. The conduct of the rat we are told was the same in a second encounter, in which it was victorious. This proves that under favourable circumstances it is more than a match for its ancient enemy.

We have said that in France the fur and the skin of this animal are utilized. We are told that if our prejudices were not so great, its flesh might also be used as food. The grain-fed rat is anything but coarse food, and when soldiers and sailors have been in straits for food, rats have been eaten with a relish. We are afraid, however, even if we were to suggest to poor Hodge that he may now and then make a pie out of the varmint in the wheat-rick, he would reply, "Well, maister, suppose thee try it thyself?"

## THE WATER SUPPLY OF LONDON;

AT PRESENT AND IN THE FUTURE.

THAT the great necessary of life, water, should be in the hands of public companies, and that they should be permitted to make a profit out of an element that God plentifully provides, is one of those things which people living under foreign governments cannot well understand. If we can entrust the circulation of our letters to a public department responsible to the ministers of the Crown, it seems much more reasonable to suppose that we should do the same thing with those streams that circulate among us, and without which we should perish in a few days. Possibly the time is not far distant when that distrust of Government machinery which we find it so difficult to dispel will, in so essential a matter as water, be overcome; meanwhile, however, we must make the best of the

public companies which have taken upon themselves the duty of supply, and reap the profit.

It is difficult to imagine the metropolis of England dependent upon pumps for its water supply, as indeed its northern districts must have been to a late date, comparatively speaking. The inhabitants living in the neighbourhood of the Thames were of course supplied from that source. In early times, before we were silly enough to turn our valuable sewage into the river, the Thames was a comparatively pure stream even within the limits of the City—far purer, in fact, than it is now at the highest sources from which the existing water companies draw their supply. The labour of supplying it must have been very great, however, and when, in the year 1580, Peter Morris, the Dutch engineer, a man familiar with the water-works of his own country, erected works to drive the element not only into every house, but to certain elevations within them, he must have been thought a very clever fellow indeed. Take any old print of London Bridge as it was at that period, good reader, look at the side arches on the City side, and there you will see the simple machinery by which Morris worked the first system of water supply in England.

Huge water-wheels, which revolved with the rise and fall of the tide, did for us, in an imperfect manner it is true, in the days of Elizabeth what steam does for us so well in these days; it drove the water with no

small force throughout the wooden pipes laid to conduct it to every part of the metropolis. Many men now living can remember these enormous water-wheels standing upon old London Bridge, as it was not until the beginning of the present century that they were taken down.

When once the Londoner saw the advantage of doing away with the water-cart and water-carrier;—another source of supply, in order to supplement that of the Thames in districts situated some distance from its banks, began to occupy men's minds, and in 1607 Sir Hugh Middleton proposed the formation of the New River, a deep cutting as far as the springs of Chadwell and Amwell, in Hertfordshire. This work was no mean one in those days, as, with the windings of the river, the distance was not less than forty-two miles. It was completed, however, in six years. James the First largely patronized the scheme, otherwise it would have hung fire for many years, as the timid capitalists of those days did not approve of the "new-fangled scheme." We can still look upon this early work in the pleasant meadows near Stoke Newington. The cutting, which never was of a very formal character, now puts on quite a pastoral appearance, looking very much like some pretty country river, shaded here and there with trees. Originally it meandered, it is true, like any other water, in courses, following the drainage level of the country; but of late years

many of these bends and turnings have been shortened by near cuts, which have reduced the distance from the river-head or springs to twenty-eight miles. The springs are no longer the principal feeders of the supply, which is now drawn from the river Lea at Hertford. In this respect we have gone back from the original design, as no doubt the spring water conducted along the New Cut of the days of James was purer than the present stream, however well it may be filtered. The London Bridge Company was absorbed into the New River Company upon the destruction of its water-works upon old London Bridge, and therefore it is ranked as the premier company, not only as regards age, but as regards the extent of the area to which it affords a water supply. Until the end of the last century, there was no such a thing known as the high pressure supply, which now sends the water to our topmost stories. The completion of the steam-engine at that time enabled the hydraulic engineers to force the water through the elaborate system of pipes which now traverse all our streets, scale our walls, and place the day's supply at such a height in our cisterns that by its own gravity it flows and supplies every tap below. The establishment of the steam-engine soon deprived the New River Company of the monopoly it enjoyed until that time. Speedily other companies were formed, and now the metropolis is supplied by eight water systems, worked by joint-stock companies

all pretty much on the same plan. The areas of these companies are strictly mapped out by Act of Parliament, the boundaries of which they are not permitted to pass. As the sources from which these different water systems derive their supplies are various, and as upon the purity of the water in cases of epidemics the health of a neighbourhood depends, it may not be uninteresting to the house-hunter to be informed of the comparative degrees of purity of this element of life as distributed to different parts of London.

The New River Company supplies, with scarcely an exception, the whole of the City (Peter Morris' ground), and the high ground to the north, including Highgate, Hampstead, Islington, Hornsey, Stoke Newington, and the banks of the Thames from Northumberland House to St. Katherine's Docks. The supply is large, upwards of thirty million gallons daily. We cannot say that it is a perfectly pure supply, inasmuch as it is impregnated to some degree with earthy deposits. The New River is now used as a reservoir of subsidence. Possibly those portions of it near the metropolis contract some of the atmospheric impurities, but it may be considered free from any sewage impurity, excepting such as may be contracted by the Lea itself at Hertford. The springs at Chadwell and Amwell have been supplemented by artesian wells sunk in the neighbourhood, and at Hampstead Heath. The old Hampstead company, which was formed in

the reign of Henry the Eighth, has long merged into the great New River Company.

The next company as regards age is the Kent Water Works, which was established in 1699. It supplies the river-side neighbourhood of Greenwich, Deptford, Woolwich, and Plumstead, and runs its mains as far as Lewisham. Before the Metropolis Water Act of 1852 passed, this company drew its water supplies from the river Ravensbourne—a most foul source, which yielded a very unclean water, and which, no doubt, caused much disease during the hot weather in the thirty-three thousand five hundred houses to which it was supplied. Debarred by the Legislature from this source, the company had recourse to artesian wells bored into the chalk, which renders a fair water, although it is rather hard. The Act of 1852 may be said to have been a revolutionary one as far as the water companies were concerned. Three great companies, the West Middlesex, the Grand Junction, and the Southwark and Vauxhall Companies, removed from their old “intake” grounds, or spots, whence their pipes gathered the water, to stations much further up the stream of the Thames, and therefore where it was far purer. Hampton is now their gathering ground. Of old, the Grand Junction Company thought the waters of the canal of that name yielded fair water enough for their customers, but in 1822, thinking to improve their gathering ground,

they removed it to the Thames, near the outfall of the Great Ranelagh Sewer ; such were the ignorant ideas of that day relative to the value of pure drinking water to health. The Vauxhall Company, before they were compelled to remove, pumped in their supplies from pretty nearly as foul a source—namely, the Red House at Battersea—a point to which high tides carried the whole sewage of the metropolis. The water territory of the Grand Junction Water Company may be said to be Notting Hill, Tyburnia, the neighbourhood of the Green Park, Hyde Park, St. James's Park, and a long stretch of district extending to Brentford, Isleworth, and Twickenham. The West Middlesex Company bring their mains under the Thames at Richmond, run towards the bend of the river at Barnes, cross under the river again at Hammersmith, to the pumping station, whence it is distributed to Hammersmith, Turnham Green, Kensington, districts in the south, and Portland Town and Regent's Park in the north, extending branches even as far as Willesden and Hendon. In that direction about forty thousand houses are supplied by this company with nine and a half millions of gallons of water daily.

The Chelsea Company gather their water from Thames Ditton. The passenger over the Putney Bridge may have been puzzled to know the meaning of the rectangular tubes that are supported across the river close to the old wooden bridge. They are not

big enough for a railway bridge, and not constructed for passenger traffic. This bridge is nothing less than an aqueduct, conveying the mains of the Chelsea Company across the river for the supply of Chelsea, Pimlico, Belgravia, Buckingham Palace, and the Green Park. The Southwark and Vauxhall Company keep their side of the water, and supply the district skirting the river from Putney to Vauxhall Bridge, sending mains off to Clapham, and as far eastward as London Bridge and Rotherhithe. At least one hundred and fifty thousand houses are supplied by this company with eight million five hundred thousand gallons of water daily.

The East London Company is one of the largest of the eight, supplying the wretchedly-poor neighbourhood running from Saint Katherine's Docks to the district opposite Greenwich, and thus serving Stratford-le-Bow, Bethnal Green, Bromley, and West Ham. This district is the very poorest in the metropolis, and is also the worst supplied with water; its ninety thousand houses, together with factories, which absorb by far the largest part of the supply, being furnished with only eighteen million gallons of water per day, or only two millions more than double the amount served out to the nineteen thousand houses in the best part of the town—such as Tyburnia and the Hyde Park district, etc.—by the Grand Junction Company. Can we wonder that these poor East Enders are called

the Great Unwashed? How can they be clean if they cannot get a tithe of the water the better classes do? On the other hand, how can we expect the company to give water to tenants too poor to pay for it? We are told that such a thing as a brass water-tap is scarcely ever to be seen in the poorer houses, the lodgers almost invariably knocking them off for the money that they will bring as old metal.

Before the passing of the Metropolis Water Act, in 1852, the companies took no further steps to purify their water than to allow heavy particles to subside. The Act, however, compelled them to filter it as well. Now every drop of water supplied is passed through beds of gravel and sand three feet thick, and it comes out quite clear. Thus it is now received from the river in a purer condition, and it is given out to the public still further purified. This is certainly a great gain, but it is not all the public have a right to demand. A very poisonous water may appear to the eye quite clear, the noxious matter being of a chemical nature, and entirely transparent.

The method by which the water of the different companies is distributed to the various metropolitan altitudes, is by pumping it either direct or to high stations, and thence allowing it to flow to the different levels by gravitation. It will have been observed by the reader that most elevated spots within the metropolitan area have been utilized by the water companies for this

purpose. The summit of Campden Hill, lying between Notting Hill and Kensington, is supplied with one of these structures, in which are enclosed what are termed stand-pipes, or double pipes in the form of a long narrow U, having the bend upwards. One of these stand-pipes is one hundred and fifty feet high and the other only ninety. The engine pumps the water up to the bend, and of course there it falls over, and gives the pressure of its weight to force the column of water in advance to a similar level. The two pipes thus command the two levels economically. At Vauxhall the reader may have seen one of these tall stand-pipes belonging to the Vauxhall Company, as it is observable from nearly every part of the parish. This is the indirect method by gravitation. Some of the companies, however, pump direct from the level to the height to be reached, without the use of stand-pipes. The reservoirs of subsidence within the metropolitan area must be covered over to preserve them from the impurities of the atmosphere, whilst the filter-beds generally are situated midway between the source of supply and the houses supplied, consequently on very valuable land. The area of all these reservoirs would cover about two hundred and fifty acres of ground.

The outlay for machinery, etc., for the purification of our present supply, such as it is, is very costly, and it seems probable that, as the standard of purity that

will be demanded by the public improves, the means of meeting that demand will not be forthcoming ; for, as we said before, this purification is mainly to the eye, and not to be obtained chemically by the apparatus of the water companies. When such purity is demanded, the question will arise whether public companies have a right to perform a function which appears naturally to be one belonging to the Government. What right have they to withhold water from the poor ? The answer, because they cannot pay for it, cannot be made in the face of a people suffering from the want of one of the first necessities of life—water, even more than bread, is too terrible a thing to withhold on such a plea. Moreover, on the score of health, it seems to us to be quite impossible that we shall much longer put up with our present impure supply, every year rendering it more filthy as the population spreads up stream, and tends to pollute the sources from which we obtain it. It will not be tolerated that the first city in the empire shall drink from the foul Thames, whilst Glasgow obtains absolutely pure water from the lake reservoir which Nature seems to have stored for the use of man. What Glasgow can do to make Loch Katrine her drinking-cup, London can as well do sooner or later to make the pure and inexhaustible lakes of the Cumberland hills subservient to the same end.

Nothing could be more simple as an engineering

feat than to lay mains sufficiently large between Windermere and the metropolis, and the water would flow to our mouths by its own gravitation pure as it fell from heaven. The introduction of such soft water would not only be a sanitary improvement of the most important kind, but it would be an enormous boon to the manufacturing interest, whose losses yearly are said to amount to hundreds of thousands in consequence of the hardness of the present water interfering with the delicacy of many of their operations. Indeed, there are many processes which cannot be carried on in London from this cause. Possibly, we may not have to go as far as Cumberland for our supply. Bala Lake, in North Wales, is almost absolutely pure water, and the distance is not nearly so great as to Cumberland. At all events, the mechanical difficulties involved in the conducting of any amount of pure water to the metropolis can be nothing to a nation that has laced the land from north to south and from east to west with railroads, any one of which has involved more labour than would be required for this necessary undertaking.

## NITRO-GLYCERINE.

THE terrible accident by which eight people lost their lives some time ago, at Newcastle, has drawn public attention to this new explosive power—new to the community at large, but by no means so to chemists—nitro-glycerine, which was discovered by Professor Sobrero, an Italian chemist, as far back as the year 1851, and was made public at the British Association of that year by a paper which was read in the chemical section respecting it. Accustomed as we were to the old explosive gunpowder in a dry form, nitro-glycerine, in the form of a yellow oil, firing by means of concussion rather than by the sudden application of heat, at once excited great curiosity ; and its mighty power was practically tested before the section by the Professor dropping one drop of this oil upon a sheet of paper, and exploding it with a loud noise by the smart tap of

a hammer. Nitro-glycerine is made by mixing nitric and sulphuric acids with glycerine. It is formed somewhat in the same manner as gun-cotton and gun sawdust, the former explosive having been discovered earlier.

The substance with which the public have to deal commercially is known as glonoine, or blasting oil, as it is now extensively used for that purpose. Had not glycerine become plentiful within these last twelve years, this discovery would have remained a scientific toy, as it could not have been manufactured otherwise at a price which would allow it to compete with gunpowder—an instance, this, of the dependence of one powerful agent upon the discovery and cheap production of another.

In chemistry, indeed, the discovery of a new substance is often only the starting-point from which many others spring, and as the laboratory day by day is dragging forth the hidden secrets of nature, new combinations are arising which are changing our old methods of manufacture. The terrible effect of the mere knocking off the bottom of the canister containing some crystallised glycerine, some years since, has enveloped this new substance with a terror and mystery which will be dissipated, doubtless, when we are more familiar with it. We have no doubt that when gunpowder was first discovered the wiseacres of the period prophesied all kinds of disasters as certain to ensue

upon its introduction. The same thing was said of steam; and when Stephenson was bold enough to harness it to the carriage, the old coachman used to declare that there would be no managing such a terrible horse; that it would sweep travellers to destruction, and that it was tempting the Almighty to employ such an agent. Now, we will venture to say that the percentage of accidents upon railroads, through the uncontrollability of locomotives on railways, is not a hundredth part of those which take place from horses running away. As we know more of nitro-glycerine, in like manner we shall put more faith in it. The ignorance that at present prevails with respect to it, is the cause of all the disasters that have occurred. Really the carelessness with which this new agent has been handled, seems almost incredible. In scarcely a case in which the notorious accidents have happened with it, have the commonest precautions been taken. Mr. Nobel, of Hamburg, the largest manufacturer, has published a letter, in which he draws attention to the brutal ignorance displayed with regard to it. In five cases congealed nitro-glycerine has been deliberately melted over the fire; in three cases, in order to melt it, red-hot pokeres have been thrust into it; in one case, a man requiring some substance to lubricate his cart-wheel, took some of this blasting-oil for the purpose, and of course, at the first jolt, the wheel was blown to atoms. In one case it was burnt

in a lamp as an improvement upon petroleum. We may state that an ordinary light applied to the oil will not explode it, therefore the supposition that the barrel which caused such devastation in the Clerkenwell outrage was filled with this substance is not tenable. A simple light applied to the fuse, the means by which that explosion was caused, would not have exploded nitro-glycerine. It is true, that when the oil is raised to a temperature of from sixty-eight to seventy-five degrees Fahrenheit, it is liable to spontaneous combustion, as in the cases where it was boiled over the fire and heated by red-hot iron bars thrust into it; but otherwise the immediate contact of flame is not capable of causing more than that portion of the oil with which it is in contact to burn. There can be no doubt that the manner in which the oil is affected by the fluctuations of temperature is one of its weak points. If exposed to forty-six degrees Fahrenheit, it becomes solid, crystallising in long needles. Monsieur Adriani, in an essay he has written on the subject, says this oil, when in crystals, is more highly explosive than at any other time, their mere fracture being sufficient to produce that effect; but this is denied by Mr. Nobel, who very justly says that "it is the nature of every explosive to be more sensible to concussion in its liquid than solid state, since bodies as a rule are possessed of more stability at a lower temperature; while as regards nitro-glycerine, the congealed crystals, to be

exploded, require a far more potent blow than the liquid oil, and it was probably owing to the adhering drops of the latter that the Newcastle explosion took place. A crystal, thrown with great violence against a stone, is crushed without exploding, and a strong percussion cap, when inserted in it, produces the same effect. In the mines of Königsgrube, in Silesia, a large lump of congealed oil was hurled by an explosion against the rock, and dropped harmless to the ground." The glonoine oil is now very much used in all blasting operations, especially in Norway and Sweden, and even in North Wales. It exerts thirteen times the explosive force of gunpowder, and although much dearer, can be employed more economically. It is used in blasting in the same way as gunpowder; the hole is drilled, the oil is then poured down to the bottom, the aperture is tamped, and the charge is exploded by means of a fuse having gunpowder at the end, the concussion caused by the explosion of which sets off the nitro-glycerine, or glonoine. The oil requires fewer holes than powder, and splits the rock in larger masses; its results, when stones of large dimensions are required, are better than those produced by the old methods of blasting. Moreover, the pieces fall more quietly, and are not so likely to injure the quarrymen, but the gases given off are more deleterious. Mr. Nobel makes a compound, under the name of dynamote, which is seven times stronger than

gunpowder, and which is safer than the ordinary nitro-glycerine, inasmuch as it will not explode either from a spark or concussion alone, but requires the combined effect of both. The gases of nitro-glycerine expand to eight times their bulk on explosion—that is, one cubic measure volume of nitro-glycerine will give ten thousand three hundred and eighty-four cubic measures of gases; while one cubic measure of gunpowder will only yield eight hundred cubic measures of gas. In other words, bulk for bulk, the nitro-glycerine is thirteen times stronger than the gunpowder.

It is said that impure nitro-glycerine is dangerously self-explosive, even when standing quite quiet; this we suppose to be the case only at high temperatures, when a spontaneous decomposition goes on, causing an escape of gaseous compounds which exert a pressure on the vessel in which the liquid is contained; this pressure, on the slightest concussion, may cause the fluid to explode. Mr. Nobel, the manufacturer, states that he warrants all his blasting oil to be pure. Whether this be so or not, we should think it the duty of every one to store it in such a form that its explosive nature may be neutralized or held in abeyance. This may be done by dissolving it in two or three times its bulk of methylated spirit, when it is quite innocuous. In this condition it may be kept for any time, and it is said, like wine, rather to im-

prove by age than otherwise. When it is required for use, the addition of water will precipitate the oil, the layer of water and spirit merely requiring decanting off. At present this violent explosive is not recognised by the Government, and it is not legal to store it anywhere. This is an absurd mistake; it should, like gunpowder, be legal to store it under certain conditions—with methylated spirit, for instance—and in certain quantities. The action of the law at present is to treat the material as an outcast; the consequence is that, like an outcast, it is hidden away or used as petroleum or other oils, to the imminent danger of the persons handling it, who, not knowing its dangerous nature, treat it without any special caution whatever, with the lamentable results we have witnessed. At Newcastle, for instance, thirty canisters, equal in destructive force to forty-five tons of gunpowder, were stored in a public-house under the name of dirty grease. If this hidden charge had exploded in that place, half the town would have been laid in ashes, and we should have had to deplore the death of perhaps eight thousand people, and an immense destruction of property, rather than of the eight who really suffered by imprudent handling of it in the open air. The Home Secretary has directed the publication of a memorandum, in which directions are given for the destruction of nitro-glycerine when discovered, which clearly shows that it is looked upon

like a mad dog, and is treated accordingly. "If," it says, "tin cans containing this liquid should be discovered, they should be carefully removed, some heavy body should be attached to them, and they should be thrown into deep water without any attempt being made to open them." It is surely too late in the day to attempt the prohibition under any circumstances of this valuable article. We know that its manufacture can be declared illegal by the French law of 1810, which regulates employments dangerous and unhealthy, and which still obtains in many continental states ; but surely in this country we need not be subjected to any rules more stringent than those already in existence with respect to gunpowder. It is unfortunate that in the great explosions to which this substance has given rise not a single actor has remained alive competent to give any exact explanation with respect to the circumstances under which they took place. In New Jersey, where a stupid fellow employed upon a railway cutting thrust red-hot bars into a canister of this liquid in a blacksmith's shop, the whole place was blown to atoms, and every one it contained was annihilated. The same fate overtook those in the Aspinwall explosion ; at Newcastle, again, the more intelligent actors in the sad tragedy were wiped off the face of the earth in a moment. Many explosions placed at the door of nitro-glycerine are

known to have arisen from fulminating powder, the owners of which were only too glad to find a scape-goat upon whose head to place the mishap. As the old saying has it, "Give a dog a bad name, and then hang him."

## CARTES-DE-VISITE

### AND PHOTOGRAPHIC PICTURES.

TIME was when persons not over-gifted with riches were obliged to be contented with having their portraits taken with a pair of scissors. We are given to understand that the art is still practised on board the penny boats, and that a ride from London Bridge to Westminster and a portrait on black paper are equally inexpensive. These mechanical limnings left a good deal to the imagination, but we really do not know that they were one whit less artistic than those painful reminiscences of our relatives we still treasure up in black oval frames—stiff old gentlemen throttled in white neckerchiefs and resplendent in blue coats and brass buttons, and the ladies all turbans, high waists, and chains. Thank heaven, the pencil of light has delivered us from these monstrosities, and the house-

maid of to-day can obtain a portrait for sixpence which the best painter in King William's reign could not have approached in delicacy and truth of drawing. We should like to meet with a person who has never had his carte-de-visite taken. It is a thing that comes naturally, like the measles.

There is one disadvantage, however, in giving way to this piece of personal vanity. In case any individual should have a reason for retiring from society, and the cognisance of the police, it is as well not to leave his "negative" in the hands of a photographer; our guardians being particularly inquisitive respecting cartes of gentlemen who are "wanted," and many an arrest has been made on the strength of an undeniable likeness. Not many years ago the possession of a negative of any celebrity or notoriety was a little fortune to a man, and the reader will perhaps be surprised to hear the numbers of portraits that have been sold of one person. Her Majesty sells by the hundred thousand, and there was an enormous demand for the portrait of Prince Albert upon his decease. A few years ago all the most valuable negatives were in the possession of a firm of photographers of Regent Street. We may explain that the negative is the original image of the sitter reversed, the lights appearing as shades, and the shades as lights. From these negatives taken on glass, the portraits are printed by the passage of light through them upon the prepared paper. Thus from

one negative any number of copies can be printed off. The warehouse of the wholesale *carte-de-visite* establishment mentioned was a curiosity in itself; not only every celebrity was obtainable there, but the man made famous yesterday through the machinery of this firm, found that his image and superscription was distributed by them in every printseller's window throughout the three kingdoms. The rage for celebrities has long been past, the public having secured "*cartes*" of every one worth having. But even now, when a new hero appears upon the scene, some enterprising photographer is sure to come out with his photograph. Sometimes they are rather apocryphal, as for instance the one that has been published of the late King Theodore, who appears to be marvellously like one of those ferocious skin-clothed savages that used to strike terror into us as children in a moving drama at Astley's. But a real genuine hero, who has done some stirring action, may wake up and find his face a little fortune to him, or rather to the lucky photographer who may possess his negative. Ten thousand *cartes* is by no means an out-of-the-way number to sell of any great personage. Some singers have even exceeded this number, not less than sixty thousand portraits of Mademoiselle Patti having been recently in circulation. Actresses have the most constant run. A classical drama that has had a great success lately—chiefly, we fancy, in consequence of the scanty costume

of the ladies playing in it—appears to have flooded the photographers' shop windows with a class of pictures that of old only flourished—and then by the sufferance of the police—in Holywell Street.

The clearness of the *carte-de-visite* depends upon the lens, which diminishes the portrait; but this clearness is purchased at the expense of truth. We must all have noticed the hardness of this popular-sized portrait, which contrasts so unfavourably with high-class miniatures from the hand of the professional artist. This hardness is entirely artificial, and several attempts have been made to correct it. M. Claudet patented some time ago a process by which the lens was made perpetually to change its focus, and the result was a portrait in which the edges and outlines were soft and undefined. A lady, whose life-sized portraits have attracted so much attention lately, took her sitters with what is termed a view lens, or one that is perfectly flat. A minute or two is necessary to complete the portrait by this process, and the consequence is the sitter moves slightly, thus obtaining the required softness in an accidental manner. Some of her heads are as fine as anything from the pencil of Titian in their massive effects of light and shade. It is quite an error to suppose that if one lens is as good as another, no art is required on the part of the photographer. There is as much difference between two photographic portraits or pictures, as there is between

two engravers' work. The mind influences the instrument in its work in a far greater degree than we fancy. It requires very rare skill to pose a sitter well for a picture, and it is on this point that the mass of cartes-de-visite fail. The manipulator has very much to contend with, we admit, on the part of the sitter, who, as a rule, in middle-class life comes over-dressed for the occasion. Finery is the curse of the artist, and still more of the photographer, for the former may generalise and leave out parts that are objectionable, but Sol is inexorable: as the sitter comes, so he is taken, with all his imperfections on his head.

Compared with a miniature, the carte-de-visite, even as regards the drawing, has advantages as well as disadvantages. Its advantages are the wonderful fidelity with which it represents details. The artist, for instance, generalises his drapery—his brush is incapable of representing texture like the photograph; hence, we cannot gather from a miniature the social position, as it were, of the sitter. But the carte-de-visite gives all these details with the exact fidelity of Nature. We can at a glance "take stock," so to speak, of any man or woman, and from the cut and material of the dress gather the position, and, to some extent, the moral calibre of the wearer. The photographic portrait gives us equal power. There is a wonderful individuality in every picture. The workman, even in his "Sunday best," looks like a workman; and the gentle-

man dressed in fustian would show his gentle breeding. The value of these literals is great, but they have their disadvantages also. The portrait painter, when he is at his work, is never prematurely active, like the camera, taking any nervous and constrained position that may be momentarily assumed. Long before the limner has done his work, the natural character and expression has been resumed, and if the pencil be skilful, we have the man or woman as he or she naturally appears. It is wholly different with the sitter in the photographic studio. As a rule, he puts on a face to meet the stare of the camera lens, and that put-on expression is caught before his facial muscles have time to relax and fall into their natural position. Hence, many photographs are painfully unlike the originals. The muscles of the mouth, on which so much of the finer expression of the face depends, are especially liable to "dress up" in the most rigid manner when the manipulator, with a bland smile, takes off the cap of the lens, and tells his sitter to put on an easy expression—when he says "Now," a word of command that many people can no more stand without blinking than they could stand the word "Fire" when facing a platoon of musketry.

The exhibition of portraits of remarkable persons in the shop windows throws a wonderful light upon their exploits and performances. With how much clearer minds we read details of daring adventure

when the adventurers stand before us in the shop-window picture-galleries. Livingstone, Du Chaillu, Sir George Baker—their words seem living things when we know what manner of men they are. By the aid of the new art, one quality of the mind is abundantly satisfied—the craving to understand the personalities of remarkable people. There is not a distinguished individual in the civilised world the photographer has not made us acquainted with.

Things, also, as well as persons, are brought home to us with the same vivid truth. Who shall say that the series of views of the Holy Land lately published by the authority of the Palestine Exploration Committee has not thrown a flood of light upon Scripture history? We are now able to see with our own eyes, as it were, the sacred places we have been familiar with by letterpress description from our youth up. This series of photographs, wonderful for their literal truth, shows us stone by stone the scenes that are associated with the grandest dramas that have ever occurred in human affairs. The value of photography in depicting architectural effects, especially architectural antiquities, can scarcely be too highly appreciated. Who that has not actually been on the spot ever realised to himself the sublimity of the famous Sphinx, shattered as it is, before the photograph showed it to us, half-buried in the wind-blown sand, looking like an emblem of eternity? The Pyramids, again: what

human pencil ever gave such vastness to their proportions, or such wonderful literalness to their details as their sun-pictures to be seen in our shop windows?

To art generally, photography must prove a great instructor. On the Continent, it is the practice to publish photographic copies of ancient and modern works, and it can scarcely be denied that the graver is totally incapable of giving, at any cost, such literal transcripts as the sun-picture copy. The living touch of the master is rendered with absolute truth, and, wanting the colour, the photographic copy is nearly of equal value with the original. Witness the exquisite copies of Meissonnier's works published at a trifling cost. It seems to us that the occupation of the engraver is gone. His works, at the best, are only within the means of the wealthy. Now Apollo at a stroke reproduces the works of genius, and brings them within the means of most of us. Let us hope that the possessors of fine pictures in this country will emulate the liberality of those in France and other Continental countries by giving permission to have them photographed. A famous old master, or, indeed, modern master, does not belong entirely to its individual possessor, but to the whole artistic world. The man who shuts up a fine collection of pictures from public inspection is a curmudgeon, who in a petty spirit limits the teaching and pleasure-giving power of genius. This is so well understood that no gentleman

dreams of shutting his gallery to the lovers of art. Why should not possessors of paintings go a step further, and allow the photographer to bring these gems into our own houses?

The copying powers of the new art seem to be without limit. Already literature has extensively availed itself of its advantages. Some of our rarest manuscripts and unique specimens of famous editions of old books have by its powers been reproduced in the most perfect manner. Domesday Book has been by this process reproduced; costly ordnance maps reduced according to scale; in fact, all the old mechanical work of reproduction of printed and engraved matter by its agency is now performed at one tithe of the cost once demanded for performing the labour. Sometimes it is engaged to perform sensational work in not the best taste. In the shop windows of many of the photographic dealers we have seen lately two pictures, which testify to the exceedingly morbid tastes of the present day. One represents the coat and waistcoat in which the Emperor Maximilian was said to have been shot, studded with bullet perforations; the other the scene in the forest of Fontainebleau, where the terrible tragedy of the murder of Madame Mertens was perpetrated. These may or may not be truthful representations of the objects and scenes they are said to depict, but the very fact of their sale testifies to the depraved taste that is abroad among the better classes,

which we had supposed only existed among the very lowest.

The applications of photography to science are almost as numerous as to art. There are two curious examples, however, which are worthy of note. Although landscapes from the level are common enough, bird's-eye views, such as are useful to surveyors or for military engineers during a campaign, have long been desiderated. This difficulty has been overcome by the employment of the camera, either from fixed elevations or from balloons, the country underneath being cast upon the prepared paper by means of reflectors. In this way large districts of country have been photographed as the balloon passed over them. Another very curious application of the paper made sensitive to light by the application of nitrate of silver, is its use to register a ship's course at sea. A long strip of this prepared paper, wound on a drum which moves round by clockwork, is placed beneath the compass-card, which it traverses by means of the magnet attached to its under side. A small aperture is made in the compass-card, which allows the light to fall upon the prepared ribbon of sensitive paper. The ship's course being indicated to the helmsman by the skipper, his skill in keeping her in the direct road without deviation is registered by the black line made upon the ribbon. If the helmsman does his work steadily, the line appears along the centre of the ribbon; if, on the

other hand, the ship has yawed about in her course, the tell-tale paper will also bear an undulating line from side to side. Thus the captain, without being on deck, can tell if his ship has been kept steadily on her course or not. The apparatus can only be used whilst daylight lasts, of course; but it is a charmingly scientific application of the powers of the new agent, which may be used in the like manner as a detective in various occupations.

## PRECIOUS JEWELS.

JEWELS, from the earliest time, have been associated with poetry and romance, and possibly the noted gems of the world have been connected with some of the most extraordinary scenes of history, not to say of domestic life. The reason is obvious : in moments of revolution, wealth in the most portable form is always in great demand; hence, in all great commotions diamonds increase greatly in value. It was so during the French Revolution, and even in the late civil commotions of America these precious jewels fetched far higher prices than they ever did before in the New World.

We generally speak of the diamond as the most valuable of gems, but this is not really the case. The ruby is the most valuable, but it depends for its rarity upon its colour. The ruby is the next hardest thing

to the diamond. It is found principally in the East. Siam, and Ava, and Ceylon afford the most plentiful supplies. In Burmah the finding of one of these jewels is made a state event; the grandees of the empire go out to meet it, with elephants and all the grandeur of Eastern state. There are many shades of red, but the hue most approved of, and commanding the highest price, is that of the "pigeon's blood." The ruby, in common with many other precious stones, had magical properties attributed to it by the ancients; indeed, we do not doubt that in the East the superstitious ideas connected with it are as rife as ever. Our ancestors believed that it was a preservative against evil thoughts, and that much dreaded thing of old—poison. It kept the wearer safe from all evil spirits, and, what was more, its sanitary power was held to be so great that he was said never to suffer in his bodily health. Moreover, it was supposed to be endowed with a certain occult intelligence. It was believed that the gem darkened when danger awaited a person, and grew bright again when the peril had passed away. The King of Burmah, one of whose titles is that of Lord of the Rubies, has one the size of a pigeon's egg. The value of these gems goes on increasing at a much higher ratio than that of the diamond. When its weight is as much as four carats, its value varies from four hundred to five hundred and fifty pounds, a sum more than double that of a diamond of the same weight.

The diamond, although only second in real value, is certainly the first in our affections. It seems also to possess the most commercial attractions, as it is the gem most dealt in, and the one most constant in value. From the earliest ages of the world diamonds have been sought for by fugitive princes, as the passports which render them acceptable in all countries. The diamond is most found in tropical countries, and especially in India. The composition of the diamond is pure carbon crystallised. Newton long ago came to the conclusion that it was combustible, an opinion entirely opposed to that of the ancients, but Lavoisier proved the English philosopher's notion to have been rightly founded, for he burned it in oxygen, and obtained as a result carbonic acid. Although science has thus managed to destroy it, science has never managed to construct it; if it had, its value would have at once departed.

The diamond is not only valuable in itself as a gem, but its particles may be said to be invaluable as agents in cutting other gems. By means of diamond dust, and a wheel revolving at a very high speed, it cuts itself into those innumerable facets which make it so useful. Upon the cutting of a diamond much of its value depends. For instance, the celebrated Koh-i-noor, when it came into the possession of England, was comparatively rough stone, the lapidary having only cut the edges of its original form. The

consequence was that this famous gem, of which the public had heard so much, created the greatest disappointment when it was seen in the Exhibition of 1851. It was one hundred and eighty-six carats in weight, one of the largest in existence; nevertheless, from its defective cutting it looked quite valueless. In the succeeding Exhibition of 1862, it appeared as a much smaller jewel, having lost eighty carats in the process of re-cutting by M. Coster, of Amsterdam; but instead of looking like a mere lump of glass, it had put on the appearance of a dazzling light, and really looked quite as large and twenty times as resplendent as it did when it came from the hands of the Indian lapidary. Every diamond of any size, of course, possesses some romantic story. The Koh-i-noor was long famous in Indian history before it fell into our hands. At the conquest of Delhi by Ala-ed-Din it became the property of that prince, and afterwards it fell into the hands of the Great Mogul, in 1526, in whose house it remained until the time of Aurungzebe, who having permitted a European to re-cut it, he reduced it from seven hundred and ninety-three carats to the size it presented at our first Exhibition, where it made such a rude appearance. The Indian emperor, enraged at the impoverishment of his gem, refused to pay him for his work—a very mild conclusion, considering the usual manner of proceeding of Great Moguls. The conqueror, Nadir Shah, after-

wards seized it, and it fell into the hands of the English at the capture of Lahore, and became the property of our government.

A very romantic history is told of the Sancy diamond. It was taken, after death, from the body of the Duke of Burgundy, and in 1489 fell into the possession of Baron de Sancy, who sent it by his servant as a present to the King of Portugal. On his way, however, he was attacked by banditti, when he immediately swallowed the stone to save it, and after his death it was taken from his body. Subsequently to this double entombment, James the Second possessed it, and sold it in the days of his misfortune to Louis the Fourteenth. It was sold by Napoleon after the Revolution to Prince Demidoff. Diamonds are sometimes coloured, and are enhanced in value in consequence. The Hope diamond, for instance, is coloured like a sapphire, and among the Russian jewels there is a fine red diamond.

Colour is never so commercially valuable as in precious stones. For instance, the ruby, the sapphire, and the Oriental topaz are identically the same so far as the materials of which they are composed go, but they differ in value immensely. The ruby is, in fact, the same thing as a red sapphire, but the first-mentioned jewel is the most precious of stones, whilst the blue sapphire is not of any great value. Of old, all blue stones were called sapphires, and extraordinary

virtues were attributed to them. In these days, we go to the analytical chemist when we wish to discover if there is any poison in a drink, but our forefathers imagined that Nature took the place of science, and attributed to this gem the power of discovering the presence of noxious matter in any liquid in which it may have been placed. The ancients believed that these precious gems changed colour on being brought into contact with poisonous matters, and that they even had the power of killing spiders, which, in past times, were considered poisonous. The sapphire is very easily imitated, and there are many sham jewels that are passed off as the real thing. Indeed, we do not doubt that this is the case with many so-called jewels which we see on fair necks, and never dream of doubting. The Oriental emerald is an exceedingly rare jewel, and so is the Oriental amethyst. These, like the ruby and the sapphire, are varieties of the corundum, the Indian name by which they are known. The reader may not be so well acquainted with what is termed the cat's-eye jewel; it has the reputation of being a very lucky stone, and it is sold sometimes for very large prices in consequence of this supposed quality, for there is nothing very beautiful in its appearance to recommend it. The ancients, who had not arrived at the modern perfection in jewel-cutting, were in the habit of engraving their jewels, and Mr. King, in his volume on precious gems,

has given us some very beautiful examples of this art.

The emerald is principally found in New Granada, but many are also found in Salzburg and Siberia, principally in limestone rock. This gem is a great favourite with Mahometans—chiefly, we suppose, from the colour. The Orientals believe it possesses marvellous powers of a very diverse nature; for instance, it is considered capable of endowing the men with courage and the women with chastity; it is supposed to possess many medicinal qualities as well, but it is not necessary to mention them. The beryl is composed of the same material as the emerald, with the exception of its colouring matter. This can scarcely be called a precious stone, as it is found in large quantities. We are told, indeed, that a mass weighing five tons was found in America. It is used in Birmingham, under the name of aqua marina, in making cheap jewellery.

Rock-crystal is one of many valuable minerals which belong to the quartz system. It is very generally distributed over the globe in large crystals. Lumps of this mineral, often weighing many hundred-weights, are found; and it is used rather in the manufacture of articles of virtu than of gems for the adornment of the person. We meet with it in old goldsmith's work, and curious cups and goblets are made out of it,

which are often most delicately cut. Like some of the gems, it was supposed by the ancients to flush with colour when poison was poured into cups made from it. Indeed, crystal has always been supposed to possess magical properties. We all have heard, for instance, of Dr. Dee's Crystal Globe, upon looking into which, it is said, he foretold events. The Japanese and Chinese use it largely, and, among other purposes, as a refrigerator to cool the hands. A ball of this material may be seen in the shop-window of an establishment in Regent Street, where Japanese nick-nacks are exposed to view. The cairngorm, onyx, cornelian, amethyst, sardonyx, agate, and chalcedony, all belong to the same quartz system as the rock-crystal. The opal, the most delicate of gems, depends for its beauty very much upon the temperature; its rainbow-like tints—or rather, we should say, its iridescent flashes, like those on the breast of a pigeon—are always the most brilliant in warm weather; this fact should teach the wearer that it should be worn as a summer gem only. There are several kinds of opals, the most valuable being known as the noble opal; then there is a more deeply and evenly tinted red opal; and the Mexican opal, which loses much of its lustre upon being exposed to water. Thus it will be seen this jewel is very sensitive to atmospheric effects, and possibly this is the reason why

it has been supposed to possess some supernatural gift. The opal is unique in one respect, it cannot be imitated with any success. This jewel, when large, is very valuable ; there is one in the museum at Vienna valued at thirty thousand pounds.

## TUNNELS AND TUNNELLING.

WITH our modern appliances for tunnel-driving, works of this kind are only a matter of money,—the engineering difficulties are more or less easily conquered; but it is a puzzle to modern engineers how the ancients, long before gunpowder was known, and often with mere bronze tools, were able to drive the subways they did through solid rock. The longest tunnel of the ancient world was that constructed by the Emperor Claudius to draw the waters off the Lake Fucinus, now Celano, into the River Liris. This work is three miles long, in no place less than twenty feet high, and is ventilated with tunnel-shafts. Such was the splendid work of the Romans that it is still in excellent condition. Without saying a word about Hannibal's notion of tunnelling through the Alps by

the solvent powers of vinegar, we may jump at once to the experience we have had in England in works of this kind, both for the passage of canals and railroads. It is calculated that at the present time we have ninety miles of railway-tunnels, or one mile of tunnel to every hundred and fifty-four of open rail. It is generally supposed that the Box Tunnel is the longest in England; but this is an error. The Woodhead Summit Tunnel possesses this honour. Its length is three miles and sixteen yards, with a gradient of one in two hundred. The Medway Tunnel, on the South Eastern, is three thousand seven hundred and forty yards; the Sevenoaks, on the same line, is three thousand six hundred yards; and the Box Tunnel is three thousand two hundred and twenty-seven yards; so that instead of being the first as regards length, it is the fourth. The most noted tunnel, because driven under the bed of a great river, is the Thames Tunnel. It is only one thousand two hundred feet in length, but it was the most expensive work ever produced, costing one thousand pounds a yard, or two and a half times the cost per yard of the great Mont Cenis Tunnel. It is at last put to some really practical purpose, having been purchased by the East London Railway, and now brings together the North Eastern and South Eastern ends of London. We are not to lose the convenience of a subway beneath the Thames, we hear, inasmuch as Mr. Barlow has obtained permission

to construct one from Lower Thames Street to the opposite side of the river. It will be sufficiently large to admit a loaded omnibus to pass through it. This work, when completed, will be much more useful than the old tunnel, which was too far down the river to catch much traffic.

The Metropolitan Railroad is *par excellence* the line of tunnels. There will be in its whole length from Kensington to Trinity Square, a distance of little over six miles, one-third, or two miles and four hundred and fourteen feet, of open cutting, and a little less than two-thirds, or four miles and one thousand and fifty-six feet, of tunnel. A great deal has been said about the bad air of this tunnel, or rather series of tunnels; and undoubtedly the worst part of the line is between Lisson Grove and King's Cross Station, where two or three deaths occurred two or three years ago; but it is very doubtful whether it was owing to the atmospheric impurities. The atmosphere has been analysed, and in no case has there been found a deficiency of oxygen, and only a very small percentage of sulphurous or carbonic acid. The partial combustion of the brakes produces a strong smell of burning wood, but this is by no means deleterious. It is, in the words of Dr. Letheby, a pyroligneous carbo-hydrogen, with a small amount of sulphurous gas, which sets asthmatical persons coughing, but that is the only inconvenience it produces; nevertheless,

the directors have caused openings to be made at the spot where it was mostly felt.

But these tunnels are playthings compared with those projected and in progress. It has been proposed to drive a tunnel under the Mersey, between New Brighton and Bootle. This work would be four thousand eight hundred yards in length, and would cost upwards of three-quarters of a million of money. But what is a few hundred yards compared to a tunnel that shall connect the shores of England and France? Yet such a work has been seriously contemplated by several well-known engineers, and one of these days will, no doubt, be carried out. Three of these engineers propose to carry a road under the narrow sea by means of iron tubes, and another gentleman proposes a tunnel at a great depth. Of the former schemes, those of Mr. Chalmers, an Englishman, and M. de Gammond, a Frenchman, are the most startling. Mr. Chalmers suggests the sinking a tube in the Channel, in order to keep which gigantic structure moored to one spot, he proposes to cover it with an embankment of stones, one hundred and fifty feet wide at the base, and from forty to one hundred and twenty feet below the level of low water. In this tube of eighteen miles in length there are to be three ventilators, so that passengers are promised breathing-holes at every four and a half miles distance. Mr. Chalmers really thinks that his iron

subway would be a great improvement upon the open-air structure.

This is all very pleasant upon paper, but, we fear, rather difficult to accomplish in reality. He proposes to build his tube in lengths of four hundred feet, and thirty feet in diameter, and to join them under water. This is to be done at a depth of one hundred feet, and at least at a depth of one hundred and fifty feet below high water-mark in a swift tideway, and is to cost only twelve millions; but then it is to repay the company that undertakes it by yielding a net revenue of one million three hundred thousand pounds annually. But Mr. Chalmers is quite mild in his ideas compared with M. de Gammond. This gentleman, in addition to laying down the tube, suggests a great oceanic station midway in the Channel. Here he proposes to have a harbour and basins, into which any home-bound ship may enter, and discharge her passengers by means of a huge shaft, three hundred and thirty yards in diameter, opening into the tunnel, and giving egress to both England and France. This bold undertaking is estimated to cost seven million two hundred thousand pounds. So much for the iron tube scheme. Mr. George Remington, on the other hand, says that the tunnel should be driven at a depth of from ninety to one hundred and thirty feet below the bed of the Channel, making a total of say three hundred feet from the sea-level. He would cross

between Cape Grisnez and Dungeness Point. There are to be three air-shafts, of one hundred feet in diameter, and the whole he estimates to cost six million seven hundred and ninety-eight thousand two hundred pounds.

These tunnels are at present confined to the brains of their projectors, but the great Mont Cenis Tunnel has been some time finished. It is seven and a half miles in length. It was made by Italian engineers, at the joint expense of Italy and France. This great work was commenced on both sides of the mountain in 1857, and it was finished as contemplated, by the year 1873. At first the excavation was made wholly by manual labour, but afterwards the boring process was performed by the most elaborate machinery, driven by compressed air. The great difficulty to be overcome was the badness of the air, which got worse as the mountain was penetrated deeply. The blasting occasioned vast accumulations of foul air, which hung in the workings by reason of the gradients ascending from the Italian side. However, pure air was conveyed by the compressing apparatus in sufficient quantities to sustain the workmen. The advance was made from both sides, and the embrace took place four thousand one hundred and thirty-eight feet above the level of the sea, and two thousand feet below the summit of the Mont Cenis Railway, which, in seeming derision of the labours of the human moles below, climbs the topmost

passes of that mountain. The total cost of this tunnel was upwards of six millions of money. In the early days of railway construction English engineers always tunnelled to avoid a very slight gradient; now it is found that engines can go where horses can; the new mountain engine, with its central gripping rail, enabling it to climb like a cat passes that Stephenson would have shuddered to contemplate.

## VILLAGE HOSPITALS.

IN all the great cities the division of labour among medical men is carried to the utmost limit; there is scarcely an organ of the body the diseases of which have not been made special studies by scores of surgeons and physicians. This arrangement provides large populations with a numerous class of trained men at the call of the wealthy classes. They command high fees, and they deserve them, for in nearly every instance these same men give their services gratuitously to hospital patients and dispensaries. Thus, the skill the rich foster and support is given to the destitute in their hour of need. This arrangement cannot possibly be carried out in the country, and in the sparsely inhabited agricultural districts; hence the physicians and surgeons in those districts are less skilled. There are no hospitals in the villages, con-

sequently, when Hodge breaks his leg, or crushes his foot, he has no place to go to during his illness but his overcrowded home, lacking the skilled nurses and all the appliances which his brother workers in the city can command. This want leads to the transfer of the more serious casualties to the nearest city or county hospital. This plan has an ill effect both upon the patient and the medical practitioner. The withdrawal of the serious cases of accidents from the care of the latter, leads to the rusting of his knowledge. The village surgeon has a tendency to dwindle down into the mere apothecary ; the skilful use of his knife, if he ever had it, is gradually lost. Consequently when the squire meets with an accident, fearing the want of ability of the village doctor, he is forced to send to town for assistance at a great expense and loss of time. When the squire comes to feel this inconvenience, it cannot fail to be acknowledged. Poor Hodge, however, as he cannot call in the skilled surgeon, has to go to him—sometimes a long way in a rough conveyance ; and the misery of such a journey can only be appreciated by those who have undertaken it with a broken leg. And this is not the worst of it ; the chances are that the poor fellow never returns. Hospitals in towns and cities, supplied as they are with every appliance his case requires as regards instruments, skilled surgeons, good nurses, and proper food, are yet wanting in one element without which

all the aids to recovery are but too often powerless. This element is pure air. The countryman, accustomed to the invigorating and health-giving breezes of his native village, is particularly sensitive to any deterioration of the atmosphere, and consequently, when he is brought to the hospital in which possibly the fatal scourge, hospital gangrene, and pyrexia, linger, his fresh wound is, in a very large percentage of cases, attacked, and the chances of his recovery under such circumstances are very few indeed. It will thus be seen that the highest skill is of no avail; indeed, its fame serves as a trap to lure the poor countryman to his grave.

Many medical men have regretted a state of things which is so adverse to the condition of the country population, but it was reserved to the country surgeons to provide the remedy. In 1861 was conceived the idea of a village hospital of such a limited size, that it was not liable to contract and contain poisoned air of a virulent nature. By confining the arrangement to six beds, this mishap was provided against, and thus was supplied the only element of success wanting in the town hospital system. An ordinary cottage of the better class was taken, and fitted up with the required number of beds, and, with one good nurse and a general servant, the staff was complete. The two first village hospitals established were those at Middlesborough, in Yorkshire, by Mr. John Richard-

son, and at Cranleigh, in Surrey, by Mr. Albert Napper. Those who are acquainted with the large metropolitan establishments of this kind, must be familiar with the utter want of comfort they present—rather we should say of home feeling. Very large wards, with bare walls painted some dismal drab, unrelieved with a picture or familiar object of any kind, make these establishments oppressive to the spirits of the poor inmates. The village hospital, on the other hand, differs but little from the ordinary labourer's cottage; the patient feels comfortable in it, the nurse knows him, and all the beneficial influences of home life tend towards his rapid recovery. That such is the case, and not a mere fancy picture, we have the proof in the statistics of the recoveries. The great majority of the patients recover, and that is far more than can be said of cases removed to city hospitals from the country, notwithstanding that the skill of the surgeon is necessarily higher in the latter institutions. Village hospitals have since spread in all directions, and the movement has resulted in readjusting in some degree the balance between town and country practitioners. The surgeon to the village hospital, not having his instructive class of patients drained away from him to die in towns, becomes an adept practitioner. The trade of agriculture is now conducted on a manufacturing scale by means of steam machinery. Steam ploughs and steam threshing

machines are now and then productive of very serious accidents, and to grapple with them the village hospital physician is forced to keep up his knowledge of anatomy, and to depend upon his own resources and skill. In consequence, the whole country side is a gainer, and to the writer's knowledge many of the surgeons of these hospitals now retain cases arising among the upper and middle classes, that otherwise would have sought surgical assistance in the nearest large city. The one great recommendation of the village hospital, next to the advantages it holds out to the patients, is that the help afforded does not tend to pauperise the poor. A sum is charged each patient according to his circumstances. This plan makes him feel independent, and, at the same time, it reduces the charges of the hospitals to a minimum; any shortcoming is made up by the gentry in the neighbourhood most willingly. After the heavy burdens thrown upon the charitable in large towns by reason of the "establishment" charges of hospitals, the manageable proportions of these miniature hospitals is quite refreshing. During the first year, which was of course the heaviest, the whole expense at Cranleigh only amounted to one hundred and forty pounds nine shillings and sevenpence—a sum which comes within the means of any village community; indeed, a considerable portion of it was paid by the patients themselves. There are no salaries to pay the surgeon; the

clergyman and the nurse manage to keep in thorough working order the whole machine. In every moderate-sized village, far away from great towns and cities, there should be a village hospital founded on the model of the originals at Middlesborough and Cranleigh ; and it is in the hope that many of our readers may be stimulated to plant such institutions in their midst, that we have furnished the above details.

END OF VOL. I.





FRUIT  
BETWEEN THE LEAVES



FRUIT  
BETWEEN THE LEAVES

By ANDREW WYNTER, M.D., M.R.C.P.

AUTHOR OF  
"CURIOSITIES OF CIVILIZATION," "OUR SOCIAL BEES," "PEEPS INTO  
THE HUMAN HIVE," ETC. ETC. ETC.

*IN TWO VOLUMES*  
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## TO THE READER.

SOME of the Papers in these Volumes have already appeared in the 'Edinburgh Review,' the 'Graphic,' 'The Pall Mall Gazette,' 'Good Words,' and other publications. That the reader after their perusal will not find that the title belies him, is the hope of

THE AUTHOR.

*Chestnut Lodge, Chiswick.*



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# FRUIT BETWEEN THE LEAVES.

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## FALSIFICATION OF OUR FOOD.

### A HINT TO HOUSEKEEPERS.

It is not a pleasant thing to think that there is scarcely a thing we eat or drink that is not adulterated. Every tradesman has his trick ; thus, if the tea merchant falsifies his tea, the baker, in return, adulterates his bad flour with alum, and repays him with bad bread ; and the publican defrauds both of them by mixing his spirits and making up his porter. Thus, an enormous amount of roguery is expended in producing a dead level of fraud, by which no one is a gainer,—indeed, by which we are all losers, for fraud in food means something more than substituting a cheap for a better material : it means the substitution of an unwholesome, often a poisonous, food for that which

we depend upon to sustain our strength. Let us take bread as an example, as this is the staff of life, and forms the main portion of the food of the working classes. All the bread in the poor quarters of the town is made, to begin with, from damaged flour; with which, when potatoes are cheap, they are mixed in large quantities. Now, as the potatoe is a far less nourishing aliment than flour, this mixture is a direct fraud upon the poor man. The bad colour of the damaged flour, again, compels the baker to doctor his batch with alum, which, when constantly taken, is certainly not very wholesome. The amount of water in the potatoes, again, which the baker sells at two-pence per pound, is a fraud upon the purchaser; and when we add that in scarcely any case is the quartern or half-quartern full weight, the amount of loss the labouring classes have to submit to is very serious, both in a monetary point of view and also in a dietetic one. Even the butter that is used with it is universally adulterated in the lower-class shops,—and, indeed, often in the better-class ones, especially now that prices are so high. Lard, when it is cheap, is mixed with salted butter—previously well washed with milk and sweetened with a little sugar—coloured with annatto, and, well beaten up, is very often sold as Epping butter in the better-class shops. What the very poor get when these tricks are played in high-class neighbourhoods, it is hard to say. One

thing is certain: nearly a quarter of the weight is made up of water. As long as a working man buys his joint, or his chop or steak, he may feel sure that he is getting the genuine article; but directly he has anything to do with made-up meats, with alamode beef, with sausages, or polonies, he is open to the most disgusting frauds. The Smithfield Market Commission opened the eyes of the public to the frauds committed by the meat salesmen—ay, and by some people higher placed—that were enough to make people shudder. Thus, for instance, one of the witnesses examined on this occasion, speaking of diseased meat, says:—"It is purchased by soup-shops, sausage-makers, the alamode beef and meat-pie shops, etc. There is one soup-shop doing, I believe, five hundred pounds a week in diseased meat. . . . The trade in diseased meat is very alarming, as anything in the shape of flesh can be sold at one penny per pound, or eightpence per stone. . . . I am certain that if one hundred carcasses of cows were lying dead in the neighbourhood of London, I could get them all sold within twenty-four hours,—it don't matter what they died of." We said just now that if the working man or his wife bought the meat in joints, he was pretty safe; but this, of course, depends upon his ability to distinguish meat when it is good. Diseased beasts are regularly killed in the country, and consigned to the London market. It is dressed up so cleverly that the

unwary are taken in by it. We are told that one of the insurance companies who insure stock was, not long since, a party to this nefarious means of getting rid of such fearful salvage. That diseased meat is still sold in large quantities, the seizures by the police are sufficient proof. And not only meat, but fish. Not long since, two of the largest salesmen at Billingsgate were heavily fined for selling to costermongers fish that was unfit for human food. Whenever the costermonger's barrow is seen going about piled with fish, the poor man should beware, as he may suspect that there is something the matter, or he would not turn fishmonger. We were lately at the opening of some samples of preserved meats, prepared in Australia by the simple process of exhausting the air: it was as good as the finest English beef. This food, when it comes in quantities, will be sold for sixpence a pound,—a splendid contribution of our children at the antipodes to the pinched and poverty-stricken poor of the mother country. We are told, indeed, that markets will be opened in the poorer quarters of the town for this excellent food, and we have no doubt it will be appreciated.

Tea and coffee have long been the prey of the adulterator; but, luckily for the poor, it is principally the green teas and higher-class gunpowder teas that are made up. Some people imagine that the green colour is given by drying the tea upon copper plates;

this is a vulgar error. The Chinese themselves, knowing the demand there is in England for moderately-priced green tea, paint black teas to imitate it in a very ingenious manner. They make a mixture of Prussian-blue and gypsum, in the proportion of three parts of the former to one of the latter. This colouring matter is thrown among the teas whilst they are roasting, the workman turning the leaves about until his hands are quite blue. Some people cannot understand how it is that "green tea" keeps them awake. Perhaps they will now see the reason. The Chinese never drink this coloured tea themselves, they only prepare it to suit the tastes of the "outer barbarians," and surely they have some warranty for so naming us. The gunpowder is manufactured both in England and China to mix with other teas. It often has but little tea in it, being compounded of sand, tea-dust, dirt, and broken-down portions of leaves, worked together with gum into grains. When it is intended to mix it with "scented caper," this stuff is "faced" with blacklead; when with gunpowder, turmeric, Prussian-blue, and chalk are used. Black teas, as a rule, are genuine, especially the low-priced ones; but now and then re-dried leaves are re-made up, mixed with sloe-leaves. This business, some years ago, was carried on very largely. Some tea is quite as objectionable and injurious as adulterated spirits,—a fact which has never been turned against the teetotallers. Assam

tea is generally pure. Coffee is permitted to be adulterated by the government with chicory, but then the fact must be so stated upon the paper or cannister. This mixing opens the door to shameful adulteration, as the chicory is much cheaper than the coffee, and the grocer but too often takes care to put more of the former into the mixture than the latter. But chicory is not the worst adulteration that coffee is liable to: mangold-wurzel, roasted wheat flour, red earth, roasted horse-chestnuts, and we are even told that in some neighbourhoods baked horse's and bullock's blood, are used for this purpose. Our authority for this last statement is a work by Mr. P. G. Simmonds, entitled, "Coffee as it Is, and as it Ought to be," in which he says, "In various parts of the metropolis, but more especially in the east, are to be found 'liver bakers.' These men take the livers of oxen and horses, bake them and grind them into a powder, which they sell to the low-priced coffee shop-keepers at from fourpence to sixpence per pound, horse's liver coffee being the highest priced. It may be known by allowing the coffee to stand until cold, when a thick pellicle of skin will be found on the top." He adds, "it goes further than coffee, and is generally mixed with chicory and other vegetable imitations of coffee." The analytic commissioner of the 'Lancet,' Dr. Hassall, actually has tested this horrible stuff, which we will believe without his

assurance to possess "a very disagreeable animal smell." The puzzle is how people can be found to drink such horrible decoctions even in the poorest coffee-houses. The milk is always adulterated largely with water, which, at sixpence a quart, is rather too bad.

The bright green colour to be observed in pickles bought at the shops is produced by boiling a slip of copper with them. Thus, copper is often present in poisonous quantities. Avoid, therefore, good reader, very green pickles with the greatest care. The presence of this adulteration may be very simply detected. A bright knitting-needle allowed to stand in the jar for a few hours, comes out with a coating of the metal upon it, provided the adulteration exists. But copper is not only to be found in our pickles, it always exists in the green ornaments of sweetmeats; in preserved bottled fruit that should appear green, or where the preserve is red, logwood or infusion of beetroot gives the deep rich colour that the housewife envies so, and, luckily for herself and household, fails to produce in her home-made preserves. It is not pleasant to find that we may be partaking of the acetate of copper in our pickles and tarts. We are told that much of the cheap preserves is sweetened with glucose, a substitute for sugar, but very much cheaper, and possessed of far less sweetening power. The adulteration with poisonous pigments of the sweets poor little children

innocently suck, is a most diabolical crime ; but we are glad to see that the use of green colour is much less frequently employed than it used to be, even in the third-rate sweetshops. Still, occasionally, highly-coloured sugar ornaments are to be seen, the colour being metallic instead of vegetable, as it should be. Among these colours there are at least three highly poisonous,—yellow, made of chromate of lead ; green, arsenite of copper ; and red, oxide of lead. The most delicate and delicious essence of jargonel pear-drops and essence of pine-apple are made from a preparation of ether and rancid cheese and butter.

When we see how liable we are to be slowly poisoned in our food, it is not wonderful that people living in civilised countries should suffer in their health, and this warns us to look to the weapons with which we combat disease ; but these, too, on trial are found to be wanting. The nurse will be surprised when she is told that much of the arrowroot sold is made of nothing but potatoe-flour and sago-meal. Honey is adulterated with flower-starch and sugar-starch. Mercury is falsified with lead, tin, and bismuth ; opium with a dozen ingredients ; gentian with poisonous aconite and belladonna ; rhubarb with gamboge ; and castor and cod-liver oils with common oils that have no medicinal virtue. Condiments have long offered a fine field to the adulterator. Mustard, for instance, is never sold pure. Out of forty-two samples

analysed by Dr. Hassall, every one was adulterated with wheaten flour, and coloured up with turmeric. Sulphuric acid is very strong in the vinegar-cruet, and in the pepper-castor we find together with pure pepper a large per-centage of flour, ground rice, and—what does the reader think?—linseed meal: a poultice internally with every bit of beef we put in our mouths! Cayenne is universally falsified,—deal saw-dust and brickdust to give it bulk, and red-lead to give it colour. Curry-powder, also, receives this poisonous adulteration.

Our fluids are, if possible, even more abused than our solids. The great brewers, it is true, do not adulterate; but the moment their beers and stouts get into the cellars of the publican, the mischief begins. The brewer's druggist is a trade which has sprung out of these falsifications. As a rule, water is the great adulteration as regards quantity; but, in order to give strength and "bite" to the liquid, salt and tobacco are often added, and, in the case of porter, burnt sugar. It is doctored for flavour in a hundred ways: quassia is used to give it a bitter, capsicums and carraway seeds to give it warmth, oyster-shells renew the youth in old beers, and alum to give a touch of age to new beer. To make a fine froth to stout that has grown flat, there is a liquid sold in the trade as beer-headings. This abominable brew is composed of common green vitriol, alum, salt, and salts of steel.

Our advice to beer-drinkers is never to get their liquor from a public-house. That which you get direct from the brewers (and small casks can be obtained from the largest houses) is always pure, and possesses several degrees more strength than you can ever hope to get from the Golden Lion round the corner. Spirits, especially gin, are well known to be flavoured according to the taste of the neighbourhood. The poorer the quarter of the town, the stronger and most biting must gin appear to be in the mouth. Water is, of course, largely added,—in many cases to full fifty per cent. Never mind: with the addition of flavourings, such as oil of cinnamon, cayenne pepper, almond oil, sulphuric acid, etc., it is brought up to the due comforting point, and is competent to warm the cockles of the hearts of the wretched draggle-tailed women who imbibe it.

We might justly have mentioned among the articles that we rely upon to combat disease, wine, that powerful tonic, which is now surpassing all others in the treatment of depressing complaints. This article of social life has been for centuries grossly adulterated, and that which is generally given at the public dispensaries is notoriously the most adulterated of all, because the cheapest. We may say absolutely that there is no such thing as pure port or sherry imported into this country. From five-and-twenty to thirty per cent. of spirit is always thrown in to give the “body”

Englishmen are asserted to require. This admixture kills anything like fine flavour, of course, and to bring it up to the deep colour demanded (we are speaking of port), jenupega, a mixture of syrup sugar and elderberries, is added. We may add that the Portuguese will no more drink what we expressly order to be made up for us and call "port," than the Chinese will drink the coloured green tea they manufacture to suit our market. What shall we say with respect to champagne? All those who have tasted that of a cheap quality, need no reply. There is no mixture so deleterious to the health and nauseating to the stomach as this so-called wine. Nothing is so easy as to give effervescence and sweetness to simple water, the quantity and the quality of the wine required to give it a vinous flavour, is, in low-class wines, unfortunately small, but the effect of the mixture is abominable! As a simple recipe for a bad headache such wines are invaluable. The sherries are equally manufactured; they are no more like the natural wines of the country they come from, than they are like blacking. Dispensary port and sherry is, however, a far inferior article to this. Those so-called wines are either cheap red and white wines flavoured to imitate port and sherry, or they more often are the product of the north of Germany, where, of course, vines do not flourish. But of what matter is that? man can always be found equal to the occasion, as the following adver-

tisement will show, which appeared in the 'Times' on a late occasion, and which we have no doubt called forth the partner inquired for:—

**PARTNER WANTED.**—A practical distiller, having been experimenting for the last seventeen years, can now produce a fair port and sherry by fermentation without a drop of the grape juice, and wishes a party, with from £2,000 to £3,000 capital, to establish a house in Hamburg for the manufacture of wines. Has already a good connection in business. Apply to —.

With this pretty specimen of the unblushing manner in which fraud in wine is carried on in this country, we think we had better conclude.

## HOW LONDON IS SUPPLIED WITH FOOD.

WHEN three millions of people residing in one capital have to be provided daily with food, the table must be large, and the means by which it is conveyed must be very well arranged; otherwise there would speedily be a great outcry, and we should soon know where the pinch was from the newspapers. When we had to provide what in comparison may be termed a small pic-nic party—namely, the Crimean army—with food, what an outcry there was; what stories of semi-starvation, although they had the whole naval and mercantile marine at their back, and the national purse to go to market with. Yet we Londoners go to breakfast, and dinner, and tea, and, if we have money enough, such things as dearth or shortcoming are unknown. The theory of demand and supply is exemplified in the method by which we are daily fed in a

most extraordinary manner. The machinery by which our food supply is gathered to the metropolitan table day by day is well oiled, and goes smoothly enough, by reason of the grooves its wheels have worked for themselves. There is, however, one shortcoming which is daily becoming of the greatest importance to the smooth working of the whole machine, which we shall advert to in the course of our remarks. We collect our food-supply admirably; where we fail is in the means of its distribution. There is so much friction called forth in this process, that the food itself is often placed above our reach by reason of its expense—a grave fault, which is, however, capable of being remedied.

Within these last ten years the meat market of the metropolis has entirely changed its character. Of old, the larger portion of the supply came to Smithfield in the shape of living beasts, and the dead meat received was, comparatively speaking, of little account. Now, especially in the winter, the whole system has changed. As we pass through the streets we see wagon-loads of carcasses coming from the railroads packed in a methodical manner. On the steamboat stages the same cargoes may be seen landed every day. A very large per-centage of the mutton to be seen upon our tables comes in this way from Holland; and Dartmoor and the Welsh hills about Llangollen supply our tables with the delicate small legs and saddles epicures so

much prize. Scotch mutton, perhaps, reaches us in the largest quantities, Aberdeen being the principal seat of the dead meat trade for the supply of the London market. This town, indeed, is little better than an "abattoir" to the metropolis. Upwards of sixty thousand tons of meat are annually brought by the different railways alone to Newgate and Leadenhall markets. What the amount will be when the splendid new market is erected near Farringdon Street, with its ample area and its railway conveniences, which will allow of the carcasses being brought direct to the market itself, can scarcely be estimated. In the hot weather much of this supply ceases—indeed, the butcher has the greatest difficulty in keeping meat sweet, even when he kills over night for the next day's supply; and these worthies tell us that the high price of beef at the present moment is owing to the losses they sustained during the tropical heat of the last summer. In this season the live meat market in Copenhagen Fields revives with the greatest energy, and the steam vessels from Denmark, Holland, the Hanseatic Towns principally, pour their living cargoes of beeves and sheep into our eastern ports as well as into London, which are conveyed thence to our live market. Ten years ago we received from these foreign sources seventy thousand oxen and three hundred thousand sheep, besides a large number of calves and pigs. This is entirely independent of the beasts that

are driven in from the surrounding country direct into the metropolitan slaughter-houses. As long ago as 1853, when the Smithfield inquiry was made, a well-known West End butcher estimated that the supply of live stock and meat to London amounted to four hundred and eighty-three thousand three hundred and thirty-eight beasts; two million one hundred and forty thousand three hundred and ninety-three sheep; one hundred and thirty-two thousand nine hundred and seventy-six calves; and one hundred and fifty-nine thousand and fifty-two pigs; and this was then believed to have been under rather than over the mark. What the amount may be, now that twenty-one years have elapsed, we do not know, but we should say an additional five-and-twenty per cent. at least. The supply being thus plentiful, and prices in the wholesale meat markets ranging so much below those of the West End, it must be clear that the "friction" of bringing it from the central market and redistributing it, is the cause of present high prices. The butchers certainly have not a monopoly; but they combine to keep up prices, and there are no public markets in the different districts of London that respectable people care to enter. The value of a public market in bringing about competition and lowering prices is very great. Why should not the different parishes give us bright, cheerful markets, now that, with the aid of glass and iron, we know so well how to build them?

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No doubt the different railway companies, in combination with the parochial authorities, would see their interest in erecting such markets. We fear, however, that as the parochial vestries are in the hands of the trading classes, we are not likely to obtain their willing aid towards any scheme of this kind.

Fish has gradually been rising in price, and no doubt a great deal of this may be accounted for by the very confined size of the chief fish-market. Billingsgate is not much bigger than it was two hundred years ago. Of old, the supply to this market was by sailing smacks. A few four-horse vans, it is true, came occasionally from the coast at a great expense. But now even the steamers are being supplanted by the railway; fish in the summer being so perishable that speed in its conveyance is everything. Herrings, the great food of the poor, when in season, come up from Yarmouth by the Great Eastern Railway. When there has been a great catch of herrings, the news flies like lightning among the poor, and the assemblage of costermongers' barrows that immediately flock to the market is a sight to see. What the poor would do without the coster, of whose useful aid an aristocratic legislature lately endeavoured to deprive us, it would be difficult to say. When sprats are in, or mackerel are cheap, these purveyors to the poor are in the market before it is light, and by the time the town is

awake they are penetrating every court and alley with cheap and welcome food.

In November the sprat fishery comes into play. This may be called, together with the herring fishery, the harvest of the poor. The arrival of a fleet of sprat smacks causes a sensation of no mean sort among the costermongers. Immediately it is known that they have arrived, these useful, though rough fellows, swarm down to the "Gate," board the boats, climb the rigging, crowd, in fact, every point of vantage which commands the holds of the vessels containing the sprats. The reason of this is that the buyers desire to see samples of the fish before they bid for them. In order to give them an opportunity of doing this, a man steps into the hold, and with a shovel showers about the sprats in order to give every one a clear view. These cargoes are purchased as soon as they arrive by the "Bummaree," or middle-man, who sorts the cargo out into lots suitable to the buyers, and then sells them by auction. Groups of costers club their money and bid, thus obtaining the fish at wholesale prices.

The poor class, who must have things cheap, manage to solve the difficulty respecting the cost of distribution better than the West-Enders, who are often, indeed, hampered with long credits, which give them into the hands of their tradesmen. The night trains bring all the fish. Salmon comes from Ireland and Scotland, principally by the North Western line.

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During these last two or three years, as soon as the season ends with us for this commodity, we get it over by steamer from Holland. One is surprised to find a fine salmon on the fishmonger's slab in the months when salmon fishing in our own rivers is prohibited. On inquiry we find it is a Dutch fish.

Certain oysters may be had all the year round now, instead of only a few months in the year. They are of a very large and coarse kind, it is true, and not such as are likely to appear on the boards of West-End fishmongers, but they afford food highly appreciated by the poor. We allude to the "scuttle-mouths," as they are termed, oysters that come from a bed existing in the Channel between Shoreham and Newhaven. This bed is fifty miles long, and is free to all-comers, hence it was a splendid find to the fishermen of the adjacent coasts. They come by the Brighton and South Coast Railway, and by smacks, and are sold very cheaply. When the 'Times,' on a late occasion, talked about oysters costing three-half-pence apiece, it alluded to the Whitstable and other "Natives," which are artificially bred and fattened—indeed, almost as much a made-up product as another delicacy that has hitherto commanded "any price": we mean port wine.

The arrival of smacks and small boats that are to be seen about the "Gate," consists of the trolling-boats of Barking that bring us the products of the North

Sea, and of the banks and shoals of the coasts off Yorkshire and Holland—soles, turbot, etc.—and the Dutch galliots that look so picturesque amongst them, bring the same kind of cargo. The small boats are mainly from the Thames up stream ; they bring fresh-water fish, which are principally sold to the poor ; and the Greenwich boats bring the far-famed whitebait, which are generally caught near the sewers' mouths !!!

Turbot is a very dear fish, yet we are told that it exists in boundless quantities off the south-west coast of Ireland. It is proposed to bring this fish alive in welled steamers from this splendid fishing-ground. By this means salmon and cod are brought alive from Scotland. The fishing off the Irish coast has scarcely been touched, whilst we are labouring at the Dogger Bank, which has been exhausted by centuries of fishing. A few years' respite would, however, restore it to its old prosperity.

Our supply of lobsters is brought mainly from Norway. They come alive in screw steamers to Great Grimsby, and are thence forwarded by way of the Great Northern Railway. They come packed in baskets, between twenty and thirty thousand of them arriving in one morning. There is no ceremony used with them. They are thrown, baskets and all, into huge cauldrons of hot water, ready prepared in the boiling-houses near the market, and are speedily cooked. But what about the humanity of this process ?

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the reader asks. We are told that death is instantaneous ; but we are also told by the same interested parties that crabs cannot be boiled in this steady manner, inasmuch as they are so sensitive that if placed directly in hot water they dash off their claws in their agony. Now we do not believe that the nervous system of the crab is one whit more delicate than that of the lobster ; and if the one experiences such agony, we have no doubt the other does also. Unfortunately for the poor lobsters, however, they have stouter claws, which they cannot shake off, however much they may feel. The crabs, in order to save their members entire, are despatched before boiling by having a needle thrust through their heads. Could not the Society for Prevention of Cruelty to Animals see as much done for the poor lobsters, which afford us so much gratification after they are dead ?

The chief market for fowl and game is a disgrace to the City. Leadenhall is, in fact, a series of tortuous passages rather than a market. That such a place should be deemed sufficient for full two-thirds of the supply of this kind of food for such a luxurious metropolis as London, is a proof of the utter want of appreciation by the authorities of the wants of its inhabitants. It is needless to say that very much of the game sold in London is sold at a great loss to the producers. When a gentleman buys a shooting-moor in the Highlands, he does it for his pleasure. Every bird

he and his friends kill costs him, probably, five shillings, but that includes his sport; and who shall say what that is worth to a man plagued by the tiresome work of the season? When he goes down with his friends to his moor for a battue, wonderful quantities of game are killed. These are all sent off to the London market. We are told that on such occasions thousands of heads of game are consigned to the great dealers in Leadenhall at a, comparatively speaking, low price. At the poulterers' we continually see placards to this effect: "Grouse are cheap this morning," — "Partridges are down;" from which we may feel sure that Lord Tom Noddy and his party have had good sport. It is really very delightful to find our active sportsmen thus turning their healthful instincts to account, in order that we poor town-bound slaves may profit by them. The Highlands and Yorkshire send up all the grouse we consume. Pheasants and partridges come of a more cultivated soil. Norfolk and Suffolk provide us with the largest proportion required for our tables, whilst the low marshy counties of Cambridge and Lincoln supply us with widgeon, teal, and other wild fowl; but Holland is our principal market for these birds, and also for snipe. Ireland sends plovers, and Egypt and the south of Europe the quails that we see in the narrow long boxes in all the poulterers' windows. They come over here in thousands, and one wonders who consumes them. The domestic fowl, of all birds,

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is consumed in the largest quantities. From two and a half to three millions is the quantity annually required for London. Surrey and Sussex provide these delicacies mainly, but much poultry comes from Ireland by way of Bristol. The sister country also sends us, by way of the latter city, thousands of tons of geese and ducks in the course of the year; but for our main supply of Christmas fare we depend upon the eastern counties.

Covent Garden, the principle fruit and vegetable market in the West End of the metropolis, is, perhaps, the best conducted of all the metropolitan markets, and it certainly is admirably provided with every vegetable delicacy of the season, but we are afraid the prices are exorbitantly high. Indeed, according to our experience, there is no tradesman so unconscionable as the greengrocer, who charges at least two hundred per cent. profit upon his wares. Possibly the Londoner gets his vegetables both earlier and finer than any other townsman in England. The climate around the metropolis, with a few exceptions, is the warmest in the country: the great exception is, of course, Cornwall, about the neighbourhood of Penzance and Saint Ives, just where the warm Gulf Stream strikes the land. Penzance especially lays itself out to provide Londoners with the more delicate vegetables full six weeks before any other part of the country. Green peas, especially, come from this source, but

young potatoes are sent by steam from Portugal, such is the demand for them early in the spring. The market gardens around London, with their wonderful cultivation and abundance of manure, send the early rhubarb and asparagus, but very large quantities arrive from France and Belgium. As much as a hundred tons of green peas have come in one night by the South Eastern Railway, twenty-five tons of plums, and ten of black currants, all landed on the coast from France. Some packages of fruit come from Algiers; and the finest peaches, nectarines, and greengages come across the Channel, packed in paper shavings, in boxes. Normandy sends the greater portion of this fruit. It does not necessarily follow that all the fine fruit that comes to Covent Garden remains there. If there is a short supply at Birmingham or Liverpool, a telegram comes down to that effect, and the surplus supply unpacked in the "Garden," is immediately sent off to those towns by rail. In like manner, when there is a dearth in London, word is sent by the wire to the Continent, and very speedily steamers laden with the required fruit are making their way to our shores. The costermonger is always to be found here with his barrow when anything is going cheap. By this means fruit is distributed to the million at a very low rate. Possibly the reader remarked a few months ago, when the William pear was in season, the enormous

number of this fine fruit to be met with at every street turning. The perishable nature of this pear renders its rapid consumption necessary, and had it not been for this useful class of men, at least half of it would have perished. Strawberries are an English speciality—at least, those Brobdignagian specimens under the name of British Queen, Black Prince, etc., which are specially reared for the London market. There are those who prefer the old Hantboy, and the so-called Alpine strawberry, as possessing more flavour and less water than our cultivated specimens, but that is not the popular opinion, at all events. The finer specimens of this fruit, intended for the confectioners, are brought all the way from Isleworth daily, packed in pottles, on the heads of market-women, in order to avoid the jar of the vans in which the less rare kinds are conveyed to market.

Another industry peculiar to London is the water-cress trade. Large quantities of this favourite breakfast relish are grown near London. The Great Western line brings a ton a week from the beds at Cookham, Shrivenham, and Faringdon. Spring Head also supplies a good quantity, and there is a good bed at Camden Town, planted in a brick-field, and watered by the Fleet Ditch, and they are said to be unusually fine, in consequence of the amount of sewage in the water!!!

The dried fruit trade is carried on wholly in the

City. Of late years foreign fruits, that of old only the very rich could afford, are now to be met with on the coster's barrow. "Pineapple, a penny a slice," is now an old cry, but last autumn Hambro' grapes in small baskets were vended everywhere at a very cheap rate. Melons, forbidden fruit, etc., are now as common as oranges. The pineapple trade is almost entirely in the hands of Messrs. Keeling and Hunt, a firm that imports them from the Bahamas, in the West Indies. Half a million of this fine fruit come to London in the season, and more than seventy-five million oranges, and twenty million lemons. As a rule, fruit, either dried or fresh, is always to be had cheap in the streets of London—a fact we must attribute to the competition kept up by the peripatetic dealers, who with barrows and baskets are to be met everywhere. By the new Street Act, to which we have alluded, the police were enjoined to drive these poor people from the streets. The cruelty and folly of this proceeding could not have been too loudly denounced. The part these people play is a most important one. If it were not for them, thousands of people, and they not of the poorest class, would never touch fruit from year's end to year's end; for the fruiterers of the shops ask impossible prices for the very same wares. At a moment when we are complaining that butchers and bakers have an understanding among themselves by which they manage to keep up their goods at an unfair price, it seemed like

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suicidal folly on the part of the authorities to add to the list of extortioners the fruiterers and greengrocers, who would mulct us just as unmercifully were it not for the ever active coster, who, acting in a contrary spirit to the Dutchmen in the spice islands, is ever on the look-out to distribute to all, the superfluities of the earth at the lowest possible cost.

The Rinderpest, some time ago, half ruined the dairymen, but in the end this pest was a gain to the consumer, inasmuch as the milk produced by town-fed cows was always inferior. In order to stimulate the yield, they were fed with hot grains, and the heat of the confined sheds in which they were kept, fevered their blood. The regulations which that pestilence necessitated on the part of the authorities resulted in the abolition of all ill-ventilated sheds—of the annihilation, in fact, of a very large number of foul holes not fit to keep a dog in. Dairies are now licensed, and are at stated times inspected; consequently, the milk is much purer. There are fewer of them, indeed, in the metropolis. Dairy-farms a little way out of town are now becoming the rule. At the Great Western Station, and at others leading to grazing districts, at an early hour in the morning, hundreds of tall cans, made in a peculiar manner to prevent the shaking of the milk as far as possible, may be seen arriving by luggage-train just in time for the house-to-house distribution. If the line is not in good order, however,

the jolting is apt to turn the milk in hot weather—a difficulty which limits to a certain extent the distance it is advisable to carry the article. If it were otherwise, very much larger quantities would be brought from long distances, and dairy-farms would become very common ; but as it is, a radius of thirty miles round the metropolis may be said to contain the greater part of the produce of this kind London receives from the country. Eggs, in a commercial sense, we obtain from France. They are collected in large quantities—indeed, there are farms there devoted to the rearing of poultry and furnishing of eggs to the London market : possibly, as they have to wait some time to make up the number for export, that is the reason we get so many bad ones. A hundred million eggs at least are received in London annually. They do not all come from France, it is true ; Belgium affords some part of the supply, and Ireland a pretty considerable quantity. Fresh-laid eggs are such a rarity that we need not take them into account ; they come principally from Surrey, where the cultivation of fowls is much followed. The delicacies of the farmyard, such as clotted cream, butter, etc., come from the west, where the rich pasturage is particularly fitted for such products.

As a rule, the greater proportion of the food supplies come to London by the night luggage trains. This fact points to the necessity of establishing markets in close proximity to the different metropolitan railway

stations. Such markets could be arranged like the Newgate Market now building, with lifts to place the produce directly upon the counters of the dealers. The telegraph would also be at hand, giving the dealer the power of placing himself in communication with the producer at any moment, and thus ensuring a constant supply.

We have said nothing respecting the preserved meats, which have been coming over so largely from Australia within these last few years. It seems hard, whilst meat is at famine prices here, that in Australia beef and mutton should be a complete drug in the market. If science could send us over this meat preserved in joints without being cooked, our children at the antipodes would indeed be doing us a splendid service. The provision merchants have for some time been importing cooked meat in tins from this quarter of the globe, and we hope that present high prices will stimulate them to transport the superfluities of the antipodes to eke out our scanty stores at home. We understand one house intends to open markets—on a small scale of course—in different parts of the metropolis, for the sale of preserved and other provisions at a cheap rate. The more the merrier, and we may add, with Shakespeare, “We have stomach for them all.”

## DUST HO!

A LADEN dust-cart is neither a picturesque nor an odorous object, but as it drawls along the road with its sluggish driver, reduced like the dyer's hand to the colour of the material in which he works, we must regard it in an economical point of view, at least, as we would a chrysalis in its first stage of transmutation into a butterfly. "When things are at their worst," says the old adage, "they must take a turn for the better," and what to an ordinary observer can have descended lower in the material scale than the dust-heap? There mundane things seem to have reached the last stage of exhaustion, repulsiveness, and deformity.

Our painters, fond as they are of giving us pictures of still life, have never attempted a dust-heap, and yet nothing is so still as the dust. If a man might be

allowed to moralise over such an unsavoury object, the first thing that would strike him would be the painful sense of desolation it exhibits. The absolute repose of the dust, the detritus of all earthly things, the fine grains of nothingness into which the world is day by day being ground down by the action of the elements and man, is in itself impressive enough. But a dust-heap is not all dust: there, for instance, is a rusty cage-like structure, the shattered ribs of which project from the heap—the fact that it is an old crinoline is patent enough, but what a tale it tells of past finery and flaunting pride, of human life in its exultant moments! Then again we see perhaps an old bonnet, smudged and grimy, still retaining its artificial flowers. It is the contrast between the picture of the adornments of blooming life in the past, and the rotten stillness and desolation into which it has merged, which makes a dust-heap a matter upon which a wise mind may find food for thought.

Perhaps in a small compass, the refuse of our houses, if allowed to remain undisturbed, would afford to future ages a better idea of the domestic belongings, the comforts and the contrivances, among us at different epochs, than any other physical record we may leave behind us. An example of the value of refuse heaps as records of contemporary life, was afforded the other day at the exhumation of the Romano-British city of Uriconium. Here a dust-

heap, near one of the public baths, was discovered, which assisted in no inconsiderable degree to eke out a picture of semi-civilised British life after the departure of the Romans, sixteen hundred years ago. In this ash-heap were found pieces of Samian ware, keys, chains, slates with the nails still remaining in them, hinges, even children's leaden toys, bodkins, bracelets, and a bottle of eye-salve, with directions for its use stamped upon the seal!

The middens of northern Europe again, are remarkable examples of remnants left to us of ancient life; and in the detritus found beneath the lake-habitations of Switzerland, we have records transmitted to us of a period before even the tools were invented which could shape a recording stone. What would antiquaries give if they could find ash-heaps, "of the period," ranging back at intervals of five hundred years, through the last three thousand years?

But whilst we have been talking of ash-heaps, as valuable records, and moralising over them as Hamlet did over poor Yorick's skull, our dust-cart has got as far as Paddington, where the chrysalis, as we have termed the dust, begins the first of its series of wonderful transmutations—its resurrection from death to life.

Riders on the line of omnibusses which have their terminus at the Royal Oak, whilst passing over the bridge of the Paddington Canal, must have had their

curiosity excited by a singular spectacle which may be noticed upon its banks. Here are situated the yards of the great dust contractors of the metropolis, and here, from morn till dewy eve, may be seen a busy throng of men and women, who may be counted by hundreds, toiling and moiling with spade, and pick, and sieve, amid heaps of rubbish. At the distance it is not easy to discern the nature of their operations, but the view we lately obtained stimulated us to further inquiry, and with the permission of Mr. Ferguson, who is the largest metropolitan dust contractor, we were enabled to follow the dust-heap into its various elements, and to learn the different operations by which they rise again from their "ashes" to do service in the world.

The smell that greets the visitor as he enters the yard is so peculiar in its offensiveness, that with a scientific inquisitiveness we paused to analyse it. It was not sewer odour, it was not rotten cabbage odour, it was not the odour of decaying animal matter; but it was a combination of all three, with an after-flavour of old boots and dirty dish-clouts. We defy Mr. Piesse to imitate it, cleverly as he imitates the odour of the most delicate flowers. Can the occupation be healthy? we inquired mentally. We shall answer the question hereafter.

Whilst we were in the yard, several of the carts were driven in, and their contents were shot in heaps

in all directions upon the ground. Upon these heaps the men immediately commenced working, clearing away the rougher articles, and preparing the dust for the operations of the women. The women—or rather those specimens of humanity so called, for they certainly do not belong to the gentler sex—use but one appliance, and remain almost constantly in a stooping attitude. They are mere machines for sifting. The men fill their sieves, but they have a diverse duty to perform. Surrounding each sifter are several baskets, into which the contents of the sieve are sorted. Let us watch a sifter at work. As she sifts, the fine dust and coal ashes descend: these are very important elements, the use of which we shall mention by-and-by. As the smaller matters pass through, the coarser ones appear upon the sieve, and with great rapidity the woman sorts the different articles into the different baskets which surround her. First of all, there are the pieces of coal. The richness of this so-called refuse is according to the richness of the neighbourhood from which the dust is collected. In neighbourhoods where the poor reside, very few waste pieces of coal ever find their way into the dust-hole—the shovel is too often at work throwing up the ashes upon the fire to allow of any stray pieces of coal escaping; but it is far different with the richer districts, where Jeames does not pay the coal bill, and where, consequently, he does not demean himself to put such

vulgar "refuge," as ashes on the fire. A dust contractor of any experience, by merely looking at a heap, can tell whether it comes from a poor neighbourhood or not. Belgravia and Tyburnia can be detected in a moment; and the awful waste that goes on in the article of coal where "pampered menials," are employed, gives a good idea of the general extravagance of rich households arising from the carelessness of servants. The waste coal is sold to the poor in the neighbourhood.

Now appear upon the sieve the curiosities of the dust-bin. There is a bone, a valuable piece of refuse. In Mr. Ferguson's yard alone 15 cwt. is collected weekly. These bones are sent to Lambeth to be boiled, for the purpose of extracting all the fat they contain, and the gelatine for size-making purposes, and for the use of the lozenge-makers. That old bone, for instance, will yield as much gelatine as will go to make the transparent packet of sweets the little ones like so much. The bones themselves, if of the better sort, are used for a score of manufacturing purposes—nail brushes, handles of knives, buttons, etc. etc. Bones that are too small for manufacturing purposes are ground into powder and dissolved in sulphuric acid, and the product is a peculiar grey powder which sells for 16 guineas a ton as superphosphate of lime. This product is one of the most valuable fertilisers known. Mr. Symonds, in his curious book on waste substances,

informs us that the county of Cheshire, which at the end of the last century had become almost sterile in consequence of the large quantity of phosphates taken out of the land in the form of corn and dairy produce, was restored by the application of bone-dressings. Thus the mouldy bone we see in the dust-bin returns to us in the bread we eat and the milk we drink, and, for the matter of that, in the light we strike, for the phosphorus of the lucifer-match also comes from old bones. Like the giant in the fairy tale, we grind our bones to make our bread. The circle of life is ever interchangeable; and when we look on the old Egyptian symbol of eternity, the serpent with its tail in its mouth, we see how the ancients instinctively hit upon a great truth which it required the knowledge of after ages to explain in all its bearings.

Bones are the very life of agriculture, and not only do we import immense quantities from abroad, whereby, as Liebig indignantly says, we drain the fair foreign fields of their very life-blood; but we also scour foreign battle-fields, and the remains of warriors who have helped to partition out Europe into its present limits, are now doing further service by rendering up their bones to make our bread.

But there are other things in the sieve besides bones, and we must make haste if we wish to keep time with the sifter. Next comes glass. All the broken pieces of white glass are kept by themselves;

they go to the melters either to be re-melted, or to help "start the furnace," as it is termed, the sand and flint requiring some aid of this kind to make it fuse quickly. The bottles are also placed by themselves in another basket. There is nothing we throw away with greater pleasure than physio bottles; after a long illness, they are the reminders of our troubles, and we do not care what becomes of them as long as they are removed from our sight. Here they are washed, and then they go the dismal round of the sick room again and again. Ginger-beer bottles arise from their dust-bins, and refresh thirsty souls as of yore, and all stoneware articles, even down to the penny ink-bottles, if perfect, are picked out and cleaned with acid, and once more come into circulation. Even old boots and shoes are not without their value. The soles are sliced up by the shoemakers, to make the packings for the soles of new shoes. Some of the better shoes and boots taken from the dust-hole, go to the clobberers in Monmouth Street, who make their bread by patching them and concealing cracks by means of heel-ball; and now and then the more artful accomplish the same deception by means of a paste made from road sweepings, known in the trade as a "smother." Old goloshes are melted again for their rubber, and the fine rags so carefully seized upon by the sifter, together with the fine paper, go to the mills to be converted into paper.

It is extraordinary the number of crinolines that find their way to the dust-yard. They are stripped of their cotton covering, and their steel finds a place among the old iron. Under that name what an heterogeneous heap of battered articles are to be seen here—old frying-pans, saucepans, tea-trays, housemaids' pails, old tin articles. But they are speedily restored to the manufacturing world. The tinware, such as house-pails, are first treated for the recovery of their solder, which is more valuable than tin. The old iron sometimes goes across the sea as ballast, to be melted abroad. Ten years ago we exported 365 tons to the Continent. Scrap-iron that has been beating about the world is far more valuable than new iron; for instance, the nails cast in the road from horses' shoes are invaluable for the purpose of making gun-barrels. All Stubbs' patent twist barrels are made of this iron, which derives great additional toughness from the hammering it gets against the granite paving. Scraps of tin, such as the corner pieces which are made in cutting out the tops and bottoms of saucepans, are passed through the fire for the purpose of melting off their tin, and the iron of which they are composed, being charcoal-iron, is sold for a high price. A great deal of scrap-tin is used for a very singular purpose. There are many streams in the copper districts impregnated with copper held in solution. All this, if not intercepted, runs into the sea; but it has been

discovered that the copper has a peculiar affinity for tin, and some clever people have utilised this fact by placing in the streams all the odd pieces of clean tin-plate they can obtain; in time, the copper is deposited upon this, and it is recovered by melting; the refuse tin is thus converted into a trap to secure the more valuable metal.

The sifters often find money, which of course they take care to keep. It has often been a puzzle to us to account for the number of Roman copper coins that are continually being turned up apparently from the surface of the ground. From the number of coppers found in the dust-bins, it is clear that the Roman coins we discover must have been accidentally thrown away in their dust-heaps, which have long since sunk to the level of the surrounding soil.

The coarser and more bulky articles of refuse, which are raked away by the men previously to the operations of the sifters, consist of what is termed soft core and hard core. The soft core is decaying vegetable matter, the sweepings of the markets. This stuff is sent off into the country by canal to make manure. A couple of barge-loads a day leave Mr. Ferguson's premises. The speedy manner in which this refuse is removed accounts for the healthy condition of the workers in these yards. The hard core consists of broken crockeryware, old panchards, stoneware, etc.; and makes a capital foundation for roads.

Commercially speaking, the most valuable refuse is the breeze and ashes. The breeze is used to burn bricks. Many of our readers have doubtless seen in the suburban brick-fields solid piles of brick, from which the smoke of an internal fire is continually arising. Newly made bricks are embedded in breeze, every brick being kept separate from its neighbour. The breeze is lighted from below and gradually smoulders away with a red heat: in this manner the bricks are baked in the kiln to the required hardness without causing them to vitrify.

Dust contractors are generally brick-makers as well, and the barge that takes away the breeze returns with the bricks it has helped to bake. The small coal-dust and ashes is mixed with the clay composing the brick, and in the process of kilning, burns away and helps the process of baking. As London is built entirely of brick, it may be said to arise from its own ashes, as the phoenix is said to have done of old.

Among the more filthy sights of a dust-yard is the display of house-cloths, and other greasy woollen refuse, which are spread on the ground for the purpose of being dried. The destination of these worn-out and filthy articles is the Kentish hop-grounds. When a woollen rag is fit for nothing else, it serves as admirable manure; and the greasy cloth returns to us in the shape of the fragrant hop—in bitter beer we drink up our dish-clouts! But it must

be very filthy and greasy indeed to find this final resting-place.

There are a number of mixed fabrics with warp of cotton and woof of wool, which not long since were worthless, as they could neither be converted into manure nor into paper; but by a very ingenious process these rags of mohair and alpaca are now reduced to their elements by the action of superheated steam exerted under the pressure of six atmospheres in closed digesters. The wool is reduced to a fine black powder known as an excellent manure, by the name of *Ultimate of Ammonia*, leaving the cotton intact and fit for the paper-maker. An old woollen waistcoat or coat is sometimes raked out of the dust-heap; but this, if not too dirty, finds its way to the Yorkshire mill, where it is put into the "devil" and reground for shoddy. The material which furnishes most of the cheap garments of the shops, and for the matter of that, some of the fashionable Petershams, Tweeds, and Witneys, are made out of this material. When a garment is too worn to be "revived," to this end it comes; and, as may be supposed, the manufacture of shoddy has grown into a mighty trade, which is carried on principally at the town of Batley, in Yorkshire. The amount of old clothes worked up afresh in these mills annually is equal to 20,000 tons of rag and wool; from this it will be seen what an enor-

mous amount of fleeces we save by this simple reconstruction of what but a few years ago was a useless rag. Sometimes pieces of bread, if not too stale, are taken possession of by the women and placed in their wallets as one of their "perks," as they term the small articles they are allowed to take home with them. In France a very remarkable man has built up a colossal industry in this very article. Observing the amount of bits of bread that were wasted at every table, and at the same time noting the quantity of bread crumbs used in French cookery, he applied himself to the new industry of bread collecting; and by degrees his carts were seen all over Paris. He collected from the *chiffonnier's* basket, from the convent slop-tub, from the restaurant, from the private houses, etc., and he established bakeries, in which these refuse pieces were baked and then grated fine by young girls. There is scarcely a restaurant in Paris, excepting those of the highest class, in which, if you order *soupe au pain*, or *purée au croûton*, you will not be pretty sure to taste old crusts refreshed by the process of the ingenious Frenchman. The burnt pieces he converted into tooth-powder. He has long since retired with a splendid fortune; but the process is still carried on, and the carts in which the bread-scrap are collected are still to be seen going about Paris in every direction.

Of all the commodities rescued from decay by the ingenuity of the dust-contractor, the most valuable is the breeze, which makes the ashes of cities a source of revenue, instead of an obnoxious refuse to be got rid of at great expense. Its value of course depends upon the amount of building going on; and as in London houses are springing up in every direction, this refuse must yield a large return to the parochial authorities. A chaldron of breeze, when in great demand, is said to be worth a guinea. If we had not been so improvident as to give away to a public company the greater portion of the sewage collected by the main-drainage scheme in the pumping-places in Essex, a splendid return might have been expected from this refuse in every sense of the word; and this, together with the dust, should have yielded a profit which would have cleared off the greater portion of our parochial rates. We are told that the refuse of Antwerp, which at one time cost the authorities £1000 annually to cart away, is now sold for £40,000. Now, considering the size of the two places, the refuse of the metropolis, reckoned at the same rate, ought to be, at least, worth a million of money annually—a sum more than sufficient to pay all parish expenses, and perhaps to yield something over to the ratepayer.

But we must not close this paper without saying something about the dustmen and women, as well as

the dust: and first, of the ladies. The *chiffonnières* of Paris are said to be amongst the most savage and abandoned of that ungovernable population, and history has recorded the atrocious part they played in many a horrible scene during the Revolutionary days. The English *chiffonnière*, we fear, does not rank much higher morally than her French compatriot. But though gross and animal to the last degree, and so unsexed that you doubt whether she even be a woman, yet there is a touch in her of the national manly character. When these women fight among themselves, which is pretty often, there is none of the scratching and hair-pulling which distinguishes the usual contests of the sex: they are manly even in their rage. They simply go to work exactly as men would do. The lookers-on form a ring, the principals have backers, and they set to work with closed fists, and fight as fairly as Tom Cribb would have done. In the last century, there were professional boxers of the female sex, who fought for money, just as men do now; but even these professionals do not appear to have conquered the female tendency to claw, as it was made a condition of each match, that the combatants should fight with money in their hands which was forfeited to the opponent the moment it was dropped, thus providing against the use of the nails. But the modern dust-woman does not require this ingenious method of restraint, and she gives

and takes with a gallantry and pluck, if we may use the term, which cannot be excelled by any member of the prize-ring. It is well to note even the spirit of fair-play among them, for otherwise they form the lowest dregs, intellectually and morally, of the population. Their wages are only one shilling and two-pence a day, and their "perks"—as they term their perquisites, which consists of one pailful of cinders, and as much refuse wood as they can carry home daily—are valued at about three shillings more weekly. Working so hard as they do for eight hours per day at such a repulsive employment, and getting such small pay, it may be concluded that their ranks are recruited from among the very lowest of the population. Nevertheless, they are not so low but that human sympathy and kindness may reach them, and we regret to find that as a class they have been utterly neglected by those worthy people who go about doing good. We do not allude to mere tea-meetings, for we fear that these alone, however well conducted, can have no permanent influence upon their life, but to that constant intercommunication with a fairer and more beneficent civilisation, such as some of our charitable visiting societies afford. At present they are as much outcasts from any species of culture, although living in its midst, as the Indian squaw.

We fear the dustman is no whit better than the

dust-woman. They are, in fact, a sadly drunken lot; perhaps the nature of their occupation may, to a certain extent, excuse this. It seems now to be a practice with them never to empty a dust-bin without demanding two-pence for drink-money, which they call their "sparrows," and if this is freely granted to them, or its worth in beer, which we fear is the case but too often, we may guess the amount of liquor they consume in the course of the day. There is a certain number of them who, knowing the value of the dust, call and take it away without any authority and sell it: these are called "flying dustmen," of course, from the celerity of their movements whilst engaged in their surreptitious employment. We are glad to find that, notwithstanding the filthy nature of their occupation, there is very little sickness among them as a class. This, no doubt, is owing to the open-air nature of their occupation. The mere fact that the occupation is a nuisance to the public, as far as the smell and sight is concerned, is no proof whatever that it is unhealthy.

When the proprietor of a bone-boiling factory, at Lambeth, was indicted, some time since, on account of the nuisance it occasioned, he replied to the charge by producing in court a healthy family of young children, who had been brought up in the midst of the so-called unhealthy atmosphere. The dustman can make an equally good report of the scavenger's yard,

for, underneath that grimy coating of dust, he is ruddy and fat, far healthier-looking than the city clerk, who never soils his fingers with anything fouler than ink, and never exerts himself beyond getting up and down from a stool. Dr. Guy, indeed, who has considered the class from a sanitary point of view, says they are far healthier than the majority of working men, and that the master scavengers "are the healthiest set of men I have ever seen." Nevertheless, we do not think even this high authority will induce anybody to live near a "laystall" or scavenger's yard, which is certainly the most repulsive-looking place we have ever seen.

## A WORD TO PORT WINE DRINKERS.

IN the International Exhibition of 1862 a section was devoted to the Continental wines, which few of us gave ourselves the trouble to examine. Not having a "tasting order," it was very natural that, like the fox, we believed the produce of the grape within the bottles to be sour. Besides, the average Englishman, inheriting from his fathers a very decided opinion in the matter of wine, turned away from the department with a certain supercilious contempt at the idea of anything in the shape of grape juice daring to put in an appearance as popular drinks beside the national liquors, port and sherry. Nevertheless, strongly as the Briton's prejudice runs in favour of the wine of his fathers, it must strike him when travelling abroad that the wines which he meets as his only companions in the large majority of English households are there nowhere to

be found. The food that we eat (with some difference in the matter of cooking), the furniture that surrounds us, the clothes that we wear, as far as the better classes are concerned, are the same from one end of Europe to the other; but if we ask for port or sherry, the keller or the garçon stares at us as though we were asking for a slice of boiled dodo or a draught of nectar. The stray tourist who may happen to find his way to the Peninsula possibly promises himself that here at least he will find the "true standard of sherry." He takes the wine of the country about Xeres, and prepares his palate for his accustomed flavour. Pshaw! he exclaims, that's not sherry; and possibly he takes out his pocket pistol, carefully stowed away in case of emergencies, and with a look of triumph proffers it to the nearest native at hand. It is now his turn to witness a surprise; his "nutty old brown," for which he has perhaps given sixty shillings a dozen, the mulcteer at the wine counter spits out with a wry face as though he were tasting poison! Straying still further west among the Lusitanian wines, he may promise himself that at least here he will find something that reminds him of home, of the cosy fireside, of walnuts, and that delicious '34 port of Sandeman's shipping. He tastes, he makes a face; he asks for Port, and not Burgundy. Alas! the waiter tells him that is the wine of the Alto Douro, as they knew it, and possibly the tourist hurls a curse at him for his ignorance, after the

manner of indignant Britons. But after a while, if he has any habits of reflection, at odd times it must come across his mind that it is certainly strange that nobody in the wide world ever knows anything about port and sherry but paterfamilias at home, or that even where these articles are compounded (as he imagines), they do not seem to recognise them either by name or taste! They treat—what we nurse for a lifetime in our cellars with all the care as regards temperature that we should give to a tender child—as a medicine, composed of half-a-dozen flavours, which they eject as speedily as possible. It certainly is strange! This is the conclusion to which the traveller whose mind has not been case-hardened by habit gradually comes, and, if we mistake not, it is the mental attitude of the rising generation of Englishmen at the present moment with respect to the wine question. Thoughts, habits, and tastes are beginning to be free, which they certainly have not been for this last century. A man may now wear his cap with defiance, which his father dared not have done without incurring the condemnation of his neighbours. Under these circumstances it will not perhaps be considered outrageous if we venture to discuss the qualities of port and sherry, which, like old servants, have tyrannised over us for so long a time. Like the old butler upon whose nose they blossom, they bear the very highest character—until they are inquired into.

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Port wine then, the production of the Alto Douro, cannot strictly be called a wine at all; that is, it is no more the pure produce of the grape than ketchup seized lately in London is the product of the mushroom. Until a few years ago no produce of this celebrated district could leave the country until it had been dosed with alcohol to the amount of twenty-five per cent. This was and is still done with the idea of stopping fermentation, and at the same time of preserving a certain amount of sweetness in the wine to suit the Briton's palate, who is supposed to like his liquor hot, sweet, and strong. And the reader must remember that this is done, not only with the inferior qualities of wine, but with the very best. It could not, until the recent changes in the Portuguese customs, be allowed to leave the country without being thus "fortified," and without a certain amount of elderberry juice being added to improve its colour!

Young wine when it arrives here is of course undrinkable with these additions. Imagine, good reader, a liquid which is prized by its votaries for its exquisite bouquet and flavour, so delicate that a connoisseur has to turn it in his mouth for five minutes before he can sufficiently appreciate its quality! Imagine, we say, its having such disturbing influences in it as brandy and elderberry juice! Imagine an English-grown pine-apple served up in treacle sauce, and then only you get a fit parallel of the kind of service rendered

by these port wine improvers ! Of course, wine subjected to such tampering is not drinkable ; but it is considered fit to “lay down,” as the wine merchant informs you. Now this process of laying down may be of longer or shorter duration—ten years, twenty years, or thirty years are very usual terms. The vintage of 1846, for instance, is now considered to be in marvellous condition, and demands a large price in the market. To have to wait thirty years until a wine develops itself is a serious matter, even when time alone is considered. “Grow pears for your heirs” is a well-known adage ; and to have to lay down a wine which the middle-aged man can scarcely hope will ripen in his lifetime, is certainly a damper. But then he may buy what other men have laid down, as he may buy old trees of other men’s planting. True ; but at what price ? We are not all able to drink port at seventy shillings a dozen, and below that price no wine merchant would say that drinkable port was to be obtained. But what is the meaning of this costly process of “laying down” ? It is the only method by which the real produce of the grape can be partially purified from the brandy and elderberry juice which has been added to it. We wait for thirty years, we treble its expense, for the pleasure of nursing the sickly child swathed in cobwebs, or kept at an equable temperature by the ever burning gas-light—to produce what ? Not a pure wine flavour certainly ; for we defy

the most liberal connoisseur to say that the utmost result of his nursing has culminated in a pure wine flavour, which should be the only legitimate result of his self-imposed labour.

The old port wine drinker will doubtless reply, "Manufactured or not, the result is a flavour I like, and there is an end of the discussion." Doubtless there is as regards the old port wine drinkers; but they represent an age that is departing, and they will go on with their familiar tippie to the last, just as the old coachman thinks "there is no travelling like the old stage coach with four spanking bays." But there was such a thing as a pure wine flavour before port was concocted to spoil the taste for it, and there will be those who will appreciate it after the old port wine school has departed from among us.

In order to show how merrily the game of "fortifying" port is carried on, we may say that whilst in 1864 we received from the Peninsula 3,344,871 gallons of that wine, we sent there 1,630,304 gallons of alcoholic spirit. In other words, we buy back at high prices the produce of our distilleries in the shape of the "good old Tory wine." This reminds us of the manner in which we are deluded in another branch of trade. We ship sprats in large quantities to the coast of Brittany, and they come back to us neatly packed in cases as sardines!

What we have said of port is equally true of sherry;

it is brandied, it is "browned" with burnt sugar, it is mixed until we are astonished at the difference in the prices and the number of the wines presented for our approval; but none of them are pure. For instance, in the Government return respecting the strength of wine in the principal wine-growing countries of Europe, issued in April, 1872, we find the following examples of the method of preparing a butt of sherry for the English market. "It is compounded of forty-one jars of different qualities of wine and spirit, in the following proportions :—

1 jar of spirit about 60 over proof,  
8 jars of sweet wine of Dulce,  
8 jars of soleras or mother wine,  
10 jars dry wine, 1854,  
14 jars dry wine, 1859."

Now we ask the reader what pure homogeneous flavour he is likely to obtain out of this mixture of sweet and dry, old and young wine, fortified with spirit sixty degrees above proof? Rather is he not likely to find half-a-dozen tastes? And is not a wine so compounded likely to produce the very acidity in the stomach to correct which, "good sound sherry" is so often prescribed? The idea that the Englishman cannot drink anything unless it possesses the character of a dram, is so fixed in the minds of the Spaniards and the Portuguese, and we may add, in many instances, the

British wine-merchant, that it will take a generation to remove it. We believe the ladies have a great deal to do with this. They take but little wine, but that they like sweet and strong; and if there is anything that the female palate abhors more than another, it is a dry wine. Men, on the contrary, have a proclivity to the latter quality of wine, and the tendency is becoming more declared year by year, and in the Amontillado sherry we have at least a wine of this character, although it can scarcely be called pure, inasmuch as it derives its flavour from some adventitious addition, the nature of which wine growers know nothing about.

But the Montilla wine, of late introduced into the British market, is absolutely pure as drank in Spain. Hitherto, however, it has been employed to mix with the better class sherries for the English market. We have only to compare this wine with the ordinary sherry, to see what we have lost by the arts of the adulterator. Its cost will, however, prevent its coming into general use in this country.

But what of the Hambro' sherries? asks the reader. The reader has only to look at the map of Europe to answer his own question. Hambro' is situated in too northern a latitude to grow wine; but Hambro' wine manufacturers can produce cheap sour wine from the nearest wine-growing countries, and can make sherries to order well enough. It is amusing and instructive to the layman, to read some of the circulars that wine

merchants now so plentifully supply us with through the penny post, inasmuch as in their trade rivalry they are apt now and then to let out some of the secrets of the trade. For instance, Messrs. Haig, in a circular issued some years ago, speaking of this Hambro' sherry, say, "We ourselves have been informed by a gentleman whose brother is a merchant in Hambro', and had, or has an establishment there for its manufacture, that large quantities of the worst German wines which are too sour to drink, but not good enough for vinegar, are brought into Hambro' and there emptied into great vats with a quantity of chalk or lime to correct the acid, the chalk being added until all effervescence ceases." Having thus obtained a neutral mass, as he calls it, a little sour wine is added "to give it life," for all wine, he said, must have acid in it; then potato spirit completes the compound, with a trifle of "sherry flavouring," or extract of sherry made at Berlin. This extract of sherry is nothing more than a manufactured ether, of which there are scores of kinds, the product of decomposing matter. All children know what are termed pine-apple drops. These are sweets flavoured with an ether made from rotten cheese. The wine compounder is in his way quite an artist. With his various ethers he compounds, with an ingenuity worthy of a better cause, the most delicate flavours, and even the different ages of wine. In this respect he is like our Wardour Street picture dealer, who can make you

an old master at a day's notice. Of course much Elbe water tempers the potency of the potato spirit, which can be sold in that country at a shilling a gallon. This will account for the tempting descriptions of the Hambro' sherry and the Elbe sherry, advertised by some wine merchants as "good sound wine" at twelve shillings a dozen—a price at which a good profit can be made both by the wine merchant and the doctor, for the aid of the latter will certainly have to be called in after the patient has indulged in this delicious luxury. Messrs. Haig significantly ask another advertising wine-house what has become of the 40,000 gallons of Hambro' and Bremen wines of this character on which they had paid duty last year? Very probably to make "mixed sherry," which has become a regular article of sale at such prices as will suit that terrible class—genteel poor people. But we are told there is a lower depth still in the wine trade, and another wine circular quotes an advertisement cut from a daily paper, in which the advertiser, a "practical distiller," sets forth "that he can produce a fair port and sherry by fermentation without a drop of the grape juice," and only wants a partner with between £2000 and £3000 to establish a manufactory in Hambro' for that product. We do not doubt the fact that wine can be imitated after a manner with success, considering the number of compound flavours to which the majority of wine drinkers are accustomed. If men

are allowed to mix and "fortify," and flavour as they like, the public are at their mercy, they never know what a pure wine is, and they have consequently no standard of comparison to judge by. Not long ago, grocers were in the habit of adulterating coffee with chicory, and the evil became so great that Parliament was obliged to prohibit the practice. Why should wine merchants be allowed to adulterate wine as they do? a far more important matter than coffee, as in some cases it is one of the best medicines we have, and in all cases it is the great restorative to the exhausted nerve and body. No; let us put our trust in pure wine, and in pure wine only, and then at the worst we shall suffer at the hands of nature, and be delivered from the tricks of knaves and plunderers.

That Englishmen are not wedded to hot and sweet wines we have the best proof in the returns of the Board of Trade, which show that the pure wines of France and Germany have been steadily advancing in public estimation, whilst those of Spain and Portugal have been almost stationary. Mr. Gladstone's tariff, by which all wines containing less than twenty-five degrees of spirit, are allowed to come in at one shilling a gallon duty, has opened the door to a crowd of new wines that were utterly unknown to the public before. As the trade in them is comparatively new, the art of sophistication is unknown to the growers; and as we are beginning to exercise the palate in a legitimate

manner (a duty we have forgotten since political teachers have bound us to the products of Portugal and Spain), the chances for pure wine are suddenly brightening. With clarets and Burgundy the better classes are familiar enough; two centuries ago all classes were also versed in the wines of the fair fields of France, but that was before politics changed our tastes. With German wines again our best tables have been long acquainted. But the new visitors to be naturalized (we hope) among us come further from the East, and although to be classed as, *par excellence*, pure wines, can scarcely be termed light wines. Such, for instance, as the Greek and the Hungarian, which but rarely find admittance under the twenty-six degrees of spirit test, so full are they of natural spirit evolved by the fermentive process.

As a rule, the English do not like light wines; that is, wines of a low alcoholic strength. Northern nations as a consequence of their climate demand a stronger wine than do those of the south. We possess this desire in common with the Danes, Swedes, and Russians. The polite classes, it is true, favour claret, but the polite classes possess many sources of excitement and exhilaration not open to the great public. Whilst, however, we confess that in this damp climate, claret is not likely to be universally drunk, we by no means wish to join in the cry that it is an acid, washy wine, and, like its brethren from Rhineland, is likely

to produce pains in the stomach. Very great ignorance prevails on the part of the public in this respect. It often happens that there is more acidity in a sweet wine, than in one which really tastes a little acid. The sugar sometimes placed in wine hides its acid ; but it is the former, and not the latter, which produces acidity of stomach ; practically we avoid sugar in diet, when there is any tendency to acidity, but singularly enough we do not follow the same rule with our wines. As the late Dr. Lankester truly says, in his ' Lectures on Food,' neither tartaric acid, acetic acid, nor any other acid, has a tendency to favour the development of more acid in the system. In justice to the French and German wines, we must say this much on their behalf. Nevertheless, there is a certain thinness and coldness which does not, we own, agree with the English palate.

We do not think, however, that the stream of public favour is setting in towards pure wines, in which the natural fermentation of the grape yields a vinous spirit, which exhilarates without that after-depression such as unhappily is the result of drinking the mixed wines of the Peninsula adulterated with spirit.

But the question of natural strength is a mere question of latitude and soil ; grapes must ripen thoroughly in order to accumulate the sugar, which is afterwards turned into vinous spirit by the process of fermentation. Now we have only to look to the map of Europe to see that there are very few countries possessing a

### *A HINT TO PORT WINE DRINKERS.*

sufficient southern latitude to ripen grapes to the required saccharine standard, abundantly and continuously. It is well known that in Germany two good vintages are scarcely ever known to follow each other ; often, indeed, several bad seasons come together, and produce a great scarcity of wine. In the southern provinces of France, bordering upon the Pyrenees, and in Spain and Portugal alone, of all the western wine-producing countries of Europe, is the sun sufficiently powerful throughout the autumn to thoroughly ripen the grape. These countries in their southern limits are on the 37th parallel of north latitude, the same as the famous wine-producing countries of old—Sicily and the isles of Greece ; but some of these isles are the seats of volcanoes, at present active. Thus the soil is abundantly supplied with those ingredients which it is well known the vine loves so well, and which exist in all countries famous for their wines. The island of Santoren, where the best Greek wines are grown, is attracting the attention of the *savans* of Europe, from the fact that at the present moment the island is alive with subterranean fires, and a new island is actually being thrown upon its bay. From the earliest antiquity this spot has been the seat of volcanic action. In antique times it was known as Callesta, the beautiful ; then as Thera. In one terrible convulsion this island was split into three. The largest portion retained its old name of Thera, the

modern name of which is Santoren. This event occurred about 250 years ago. So powerful was the eruption that the clouds of sulphur were carried as far as Constantinople, where every article of silver became suddenly blackened; and it is even said that the sea all the way to Alexandria was covered with cinders and dust. If we lived in the times of antique Greece, Vulcan would most certainly have had his forge located here, but we trust instead of forging thunderbolts, the effects of the late eruption will only conduce to filling the cup of Bacchus to the brim. In this island so penetrated with sulphur, and the hard dry scorïæ, that one not acquainted with the habits of the vine, would imagine that nothing would grow, the grape flourishes, as the grass does with us, and exhaustless quantities of wine may be produced upon the soil. In the matter of wine, the quality as well as the quantity is a very important matter. We talk of Château Margaux, of Cliquot's champagne, of Tokay, but these are articles *de luxe*, and will never touch the lips of the great middle classes, for whom the price must not exceed two shillings a bottle, and some of the best Greek wines can be obtained at this price, and many of them for less. At the head of all the new candidates for public favour we give the preference to the St. Elie. This wine, as Miss Bremer well says, possesses all the pure bright fresh qualities of the Rhenish white wines, with a vinous quality all its

own. It bears a great resemblance to the Rontella wine of Spain, but its bouquet is finer. Let the connoisseur get a bottle of each and taste them critically side by side, and we think he will agree with us, and he will not certainly be biassed against the Greek wine by the knowledge that it is not more than a third of the price of the pure Spaniard. But there are others who like the white Keffesia equally. The last-mentioned wine is the product of famous vineyards in the vicinity of Athens. It is wonderful what a little age does for these vintages; in a couple of years they deposit their tartaric acid, and then ripen rapidly. The red variety is very like a Burgundy, and forms an admirable dinner wine. But there are a score more, some very luscious in quality, some like a natural dry port, such as Santoren, Como, etc. But they all possess qualities of clearness, vinous flavour, and natural strength, that we certainly look for in vain in other wines, and their bouquet is enough to make an old man young again. Mr. Denman, of Piccadilly, who has introduced these wines, certainly may claim to having worthily seconded the late Whig Chancellor of the Exchequer, in initiating a long called-for reform of the wine trade. The Hungarian wines have already established themselves. Among these the noble Earlure has already taken a high place in the estimation of the public. Carlovitz, again, is a wine that has found many admirers, as it possesses more body

than the clarets, or even the Burgundies. Perhaps there is a thought of bitterness in these wines, to which some people will not object, but there is no denying their sterling qualities, and the good name Dr. Druett has given these and the Greek wines, every one who tastes them will endorse, and their absolute purity is undoubted. The Portuguese are now, we are rejoiced to hear, sending us an unsophisticated wine, which old port wine drinkers will scarcely recognise as their favourite wine in a state of *purity*, as it is more like a Burgundy than anything else. Montella we have already noticed as having put in an appearance. Clearly the stream of opinion is setting in towards pure wines, and fifty years hence our children, without doubt, when they taste some of our "fortified" port will wonder as much at our ideas of wine in this age, as we wondered at the old taste for Chinese curiosities which characterised the quality of a century ago.

## PREVENTIVE MEDICINE.

### FOUL AIR, WATER, AND FOOD—THE SEED-PLOTS OF DISEASE AND DEATH.

WHEN any sudden calamity of war, plague, or famine sweeps away a few thousand human beings, the public heart is at once quickly moved, and the efforts of statesmen and philanthropists are called forth to prevent or mitigate its ravages. Vast sums are collected, and public sympathy is vehemently evoked. Starving Paris during the siege, before the cry of distress was well heard, received at her feet the outpourings of the whole world's cornucopia. Yet we question if a thousand lives were lost on that occasion by the mere want of food consequent upon the investment ; but then the occasion was dramatic, the mortality was visibly brought before the eyes of Europe, and what men could do was done at once to avert the calamity. We cannot help reiter-

ating our opinion of the value of the dramatic element where suffering is concerned. Mr. Simon, in his thirteenth report, says, "It seems certain that the deaths which occur in this country are fully a third more numerous than they would be if our existing knowledge of the chief causes of disease were reasonably well applied throughout the country; that of the deaths, which in this case may be called preventable, the average yearly number in England and Wales is now about 120,000; and that of the 120,000 cases of preventable suffering which thus in every year attain their final resting-place in the death register, each unit represents a larger or smaller group of other cases, in which preventable disease not ending in death, though often far-reaching in ill-effects in life, has been suffered, and while these vast quantities of needless annual suffering, if regarded merely as such, would be matter for indignant human protest, it further has to be remembered, as of legislative concern, that the physical strength of the people is an essential and main factor of national prosperity; that disease, as far as it affects the workers of the population, is in direct antagonism to industry, and that disease which affects the growing and reproductive parts of the population must also, in part, be regarded as tending to the deterioration of race."

This sentence, terrible as it is, excites no public comment in the press. The legislature by its neglect

to put in force sufficiently energetic machinery to stop this fearful annual waste of human life, is as morally responsible for the calamity as the engine-driver of a train would be for maiming and killing a multitude, in consequence of his want of timely use of the break.

In ordinary seasons, lives equal to the population of great towns are annually allowed to slip away in this metropolis, as though by the ordinary course of nature, but, in truth, wilfully, and without attracting as much notice in the public press as would be given to the largest gooseberry. Let but the dramatic element be imported,—let the cholera sweep away in a week as many as now die from preventable causes in the same time, and a cry would arise throughout the whole land that the sanitary machinery was disgracefully ineffectual, and the cry of neglect would come with crushing weight against those in authority, although for years past they have not ceased to clamour for more thorough executive powers, for machinery that will act swiftly, easily, effectually, in the face of sudden and imminent danger.

At the present moment the three enemies we have to contend with in the metropolis are foul air, foul water, and foul food—the agents which invite cholera, typhoid fever, and infectious diseases. The magnificent scheme of sewers, constructed at such a vast expense, is looked upon as our first defensive armour. No doubt as far as it goes it is a great sanitary

triumph. A province covered with houses, as London not inaptly has been termed, so reticulated with sewers that morbid matter is at once carried away to the sea, is a spectacle such as cannot be seen anywhere else in the world; but, inasmuch as no chain is stronger than its weakest link, it may be asked if this sewer armour is equally strong throughout? The answer is in the negative. The London of thirty years ago is no longer the London of to-day. The sewage system of the Metropolitan Board of Works is year by year ceasing to be co-extensive with residential London. Like a vigorous tree, this mighty city is year by year being surrounded by a series of rings of houses, which are gradually extending beyond her sewer system, and beyond the power of its extension, constructed as this system is upon the centripetal system, necessitated by the drainage levels running towards its central river, into which at its sea-mouth their contents are discharged. It is impossible to extend it indefinitely towards its periphery. Hence, as we have said, the growing residential London—containing the homes of men of business far away in the green fields, ever extending, while its central portions are comparatively desolate—is becoming perfectly unprotected by any system of drainage. Cesspools are again in the ascendant, and Suburban London is no stranger in this respect than was the City of London in the reign of Elizabeth. And even where there are sewers, as in

the metropolis proper, they are a certain source of danger, inasmuch as the *materia morbi*, which produces typhoid fever, is rapidly reproduced within them. It has been shown by Dr. Budd, of Bristol, that immediately the refuse of the body, that has passed from a patient suffering under this disease, enters the sewer, it affects it throughout its whole length with great rapidity; hence, as he graphically asserts, the sewer becomes no more than an elongation of the patient's diseased intestine, and the only means of destroying the virulence of the poison is to disinfect with chemical agents the refuse before it is cast away.

To this conclusion are we brought at last, through a want of elasticity in our system, notwithstanding the mighty labours of our sanitary engineers.

Well might the Registrar-General in his last Census report, adverting to the increase of the outer residential ring, say, "The population of the ring round the district of the Metropolitan Board of Works has increased 4·19 per cent. per annum, or more than fifty per cent. in ten years; and there being no adequate provision for the sanitary purification of this area, which is shut out from the system of sewers lately created, it is in imminent danger."

The gravity of this danger is by no means represented by this very circumspect paragraph. Mr. Simon has adverted to it in some of his reports, and indeed its imminence is great. A ring of filth—for

by no milder term can the establishment of the cesspool system be stigmatized—is circling round London, which, if not at once remedied, will render nugatory all the sanity efforts we have hitherto made. Sewage soaking into the gravel, which forms the upper stratum of so many of our suburban districts, is sure to find its way into isolated wells, so prized for their cool and sparkling spring water, qualities which often hide the deadly sewage poison. From this source not only may we anticipate a spread of cholera, if unhappily we are invaded by it, as sewage water is one of the proved methods of spreading the infection, but also typhoid fever, which it originates.

Now that the introduction of the earth-closet system is legalised, it seems to us that the suburban districts have found a means of escape from the dilemma in which they have been placed by the failure of the sewage system to pass the high ground of many of the suburbs. Had the metropolis been situated upon an elevation or upon a flat, it is clear that a centripetal system of sewers, which would have sent the refuse to the periphery instead of to its centre, would have been the most scientific method of getting rid of it to the advantage of agriculture and to the improved purity of the river; but forming a sink as it does, a hollow, so to speak, with the river level as a drain, this system is impossible. But it may, we think, be supplemented by a circumferential system of drainage with the

utmost advantage by means of the earth-closet system, which would at once send the earth-fertilising elements to the market gardens, which are retreating countrywards before the building area, very gradually, and at a distance which seems to invite the advent of a new productive agent. Whether or not the large admixture of water will ever enable the great riches we are now throwing into the sea—to the impoverishment of the land and to the pollution of the river at Crossness—to be utilised, is a great and as yet unsolved problem; but the same uncertainty cannot apply to the earth-closet system. Not only is the deodorisation-system perfect, and the sewage rendered innoxious, but its best qualities are preserved. In alluding to this fact, which has been abundantly proved, we do not speak in a commercial sense, but with a view of showing that the system is profitable enough to work itself. When we find that a company has been formed in a large city like Bristol to supply the earth necessary for the apparatus for the mere right of collecting the residuum, which it removes to the country, it must be clear that a system of collection somewhat similar to that employed for the ashpit refuse, is all that is necessary to secure a perfectly sanitary condition to the London suburbs, which can be obtained, as far as we can see, by no other means.

The spread of London circumferentially is only an example of what is going on in every large and pro-

gressing town in the kingdom. Hence the importance of the problem which is presented to sanitarians. The growth of the evil is so great, that unless speedily grappled with and conquered, it will overpower us, and render nugatory all the efforts we have made since sanitation has become a science. And what is applicable to the outskirts of large cities where sewer drainage meets with difficulties is also applicable to small towns and villages, where a drainage system cannot satisfactorily be established. All such small communities of men either stand in a quagmire formed by their own refuse, or drain into some stream of which they drink and die, or into deep draw-wells, seemingly sunk for the express purpose of becoming centres of pestilence.

Where country villages are the property of landed proprietors, nothing could be easier than the abolition of the death-dealing cesspool and the substitution of the new system, by which the refuse is utilised which causes disease and death.

Hitherto sanitary engineers have wholly ignored the condition of the rural population in this respect, and the rurals have been left to take the consequences of their isolated position. Now, however, all this is changed; and landed proprietors have it in their power, without cost, to remove one of the main causes of sickness, which has reduced the average health of the more robust class in the community.

As we know not when we may be attacked with a serious epidemic of typhoid fever, and knowing as we do the part foul water plays in the spread of this disease, we regret to find that Parliament has neglected to enforce by law the necessary precautions to secure immediately a constant water supply. It is true we no longer allow the metropolitan companies, as in past epidemics, to place their intakes in the midst of sewage-tainted water; but the story told us by the Rivers' Pollution Inquiry, assures us that in this respect there are many large cities which are no better off than London was before the Water Act of 1852.

Only very lately a very important inquiry with respect to the severe epidemic at Turling, of typhoid fever, has led to a report by Dr. Thorn Thorn to the Board of Health, which conclusively proves that this severe epidemic was wholly caused by the present intermittent supply of water. It appears from this report, which we predict will be the death-blow of the present system, that the intermittent system of water supply causes a vacuum to exist in the water mains where the supply is cut off, and that where the water pipes and the drainage pipes are close together, whenever there is a leakage in these latter pipes it is immediately sucked into the water. This has been proved by finding sewage matter in the water supply. This fact will account for numberless epidemics of typhoid which have occurred in large cities. With a constant

supply of water this source of danger would be wholly obviated.

If we have not wholly made out the many means by which epidemics of typhoid fever, cholera, and diarrhoea arise, we may be certain that water is the main agent in their production; and that, as we have shown, the intermittent system of supply is one of the causes of these diseases. We may also say that the truth of the theory of Dr. John Simon, which he made known during the second epidemic of cholera in 1849, although questioned at the time, has been proved by our experience of every succeeding epidemic, and is now accepted as a well-established doctrine, according to which cholera propagates itself from person to person by means of polluted water supplies in a most alarming manner; and that this is the case can be proved by the fact that it is shown to have followed the mains that supplied the foul water, and avoided the mains, sometimes running side by side, supplied by an untainted supply, in neighbourhoods in which other conditions of health were identical.

Cholera epidemics, as we have said before, are not the only visitations to be ascribed to a disregard of a pure water supply; typhoid fever is as certainly caused by water polluted with excrementitious matter. The outbreak of this disease in the autumn of 1867, at Guildford, was as clearly to be ascribed to this cause as the like fever at Turling in 1874, or the outbreak

of cholera in 1853-4, to the foul water of Battersea Reach. Within a month no less than 250 cases occurred in a section of this latter suburb, supplied by a faulty water-service, received from a service-reservoir filled from a new well which, through the drainage of a fissured chalk strata, received the soakage of several sewers. Now, as typhoid fever is constantly occurring from the same cause throughout the country, there is the same need of our being continually on the watch against it. The narrow escape of his Royal Highness the Prince of Wales from this dread fever has, no doubt, made the public careful of their pump-water ever since.

The more familiar diarrhœa, which is always with us, often arises from the same drain contamination.

The maintenance of a good water-supply may therefore be looked upon as a preventive medicine of more importance than any other; yet the legislature has utterly failed to appreciate its value. The new Water Bill, instead of insisting upon a constant supply,—of so much importance to the poor, who are now obliged to store their scanty quantum in filthy courts, reeking with exhalations,—has only given its sanction to a permissive arrangement, to be carried out if agreeable to all parties! It has failed to insist upon uniform purity, which, indeed, could only be ensured by some central management. The different companies, looking mainly to dividends for their

shareholders, are allowed to supply one of the main elements of life, as liable to adulteration as are the goods of some cutting tradesman. Mr. Simon has very properly urged that there should be a weekly inspection of the supply, the results of which should be given when they are taken, instead of once a month, as they now are by Dr. Frankland, in the returns of the Registrar-General. It is impossible that we can depend upon mere trading companies of their own accord to keep the required standard of excellence. We know on authority that there is no uniformity in the time the water is allowed to remain in the reservoirs of subsidence, as the Water Act of 1852 requires; that one of the companies still maintains a pipe of supply from the river Thames, at a very foul spot, and we have no security that it may not in emergencies be again used. Indeed, during the dearth of water caused by the bursting of one of the mains, in 1865, the supply being thereby stopped for three days and nights, to meet this deficiency 10,000 gallons were taken through this very outlet from the river into one of the subsidence-reservoirs. Happily this extremely foul supply was not needed; but yet had it been supplied, the first evidence of the fact might have been a serious outbreak, if not of cholera, at least of typhoid fever. The public should not be subjected to a chance upon which so many valuable lives depend. The method of avoiding mis-

haps of this kind would be to make the mains of different companies, drawing from the same source, capable of supplying each other in case of any accident occurring to any of their works. There should be a kind of water-works Clapham Junction, by which the water could be turned for the purpose of assistance from one company's main to another.

We cannot but agree with Mr. Simon's grave denunciation of the inadequacy of the present management of a water-supply which should be in the hands of municipalities, and his words on the health report cannot be repeated too often in the public ear: "It seems to me that the public is hitherto very imperfectly protected against certain extreme dangers which the *malfeasance* of a water company, supplying, perhaps, half a million of customers, may suddenly bring upon large masses of the population. The colossal power of life and death, for which till recently there has been no precedent in the history of the world; and such a power in whatever hands it is vested ought most sedulously to be guarded against. I venture to submit that the penalty of £200, which the Metropolis Water Act imposes for a violation of its provisions, is immeasurably incommensurable with the magnitude of the public danger, which a lax administration of the law represents; and it is certain that in 1852, when this statute was enacted, the state of science did not enable it to know, as it must now

know, that a water company distributing sewage-tainted water, may in a day take the lives of hundreds." There can be no doubt, as he asserts, that the loss or damage to life by the supply of tainted water would render a company liable to an action for damages; but the proof could not be like that adduced at a railway action. Hence, we suppose, no such action has been taken by persons so injured; but for that very reason the penalties for violation of the provisions of the Act should be heavy, so as to act as a safeguard to the people.

And not only do we require drinking-water for the millions contained within this province of houses, but also baths. When some years ago our baths and washhouses were established, the narrowness of the scheme in which they were conceived escaped attention. It was not seen that what was most required was not the means of ablution, so much as a pleasant physical exercise to strengthen and refresh the body. If the old Roman in his fine air required the magnificent baths, the ruins of which still testify to the grand scale on which they were constructed, and the sanitary spirit in which they were conceived, how much the more does the grimy citizen of the sooty city demand the healthy stimulus of spacious swimming baths? Unfortunately, our river is too filthy to be utilised in this manner, but we have the waters of the various parks to our hand, and it only requires a little thought

on the part of those in authority to construct in them the finest baths in Europe. All that is wanting may be supplied at a very cheap rate: dressing-rooms under cover for those who can afford to pay for the accommodation, and covered spaces with a safe depth of water for those who cannot. In two of the parks the water is sufficiently shallow to allow of boys, and those who are learning to swim, bathing in safety; whilst in the others nothing could be easier than by means of submerged staging, to give any depth that may be necessary. Under certain restrictions as to the hours of bathing, these waters may be turned to healthful exercise-places without offence to any one. It would be difficult to estimate the advantage to the Londoner of a system of open baths, which would tempt him to learn to swim, and to exercise his limbs in this health-giving pastime. This would be the true water cure to his relaxed fibre, and a sanitary advance that we may well take up from the point where it was left by the ancients. We may, however, improve upon old ways by bringing the sea to us. There would be no engineering difficulty in laying pipes beside the Brighton line, and pumping at fixed times a sufficient supply of fresh ocean water close to our doors. We feel quite certain the briny element would prove a tonic of the highest value, and would pay in a pecuniary sense, whilst, in a sanitary one, it would be a valuable example of preventive medicine.

Equally with foul water, foul air is a constant means of propagating disease. Science has not yet given us a perfect insight into the nature of the particles which, floating in the atmosphere, produce the many fevers known as zymotic. The facts are, however, growing apace, and before long, no doubt, we shall have conquered the enigma. It is sufficient, however, for sanitary purposes, for us to know that disease may be taken in by the air passages as well as by the alimentary canal ; hence a necessity for establishing a standard of purity in the atmosphere, as well as in water. Only very lately a medical man at a coroner's inquest, declared that a young child in one of the courts leading off the Strand, died of impure air only ! What must be the number of deaths from the same cause in the filth-sodden atmosphere of Seven Dials, where the rooms are often not big enough to supply oxygen for the health of the inmates even supposing it to be pure.

No doubt, the abolition of cesspools in our great cities has wonderfully purified the air in them. Sewers so constructed as to carry off all foul impurities from the houses to a distance, have banished the great plagues which afflicted large congregations of men in the middle ages ; but it is quite certain, perfect as we may conceive this method of removing animal refuse to be, that it has its disadvantages which are of a serious nature. Whilst we have been careful to make

them watertight, we have taken too little notice of the fact that they are gasometers of a most deadly gas. We put our sewage out of sight, and think we have got rid of it, but it finds us out nevertheless. Every gully in our streets, every untrapped sink in our houses (and who sees to the traps?), is an outlet for this gas, which being much lighter than the air, has a constant tendency to escape. According to the density or the elasticity of the atmosphere, the quantity of storm-water in the sewers, the state of the thermometer, so this gas is constantly rising and forcing itself out into our houses, which serve as collectors to receive it.

The necessity of ventilating the sewers has long been a theme which has exercised engineers. Several plans have been proposed, and some have even been put in practice. Among these are suggestions for the connection of the rain-water pipes from the houses with the sewers, so as to drain off the gas as it arises. This system has been tried in some of the northern cities, but we hear that the effect has been to discharge it into the upper windows of the houses, a remedy worse than the original disease. In order to neutralise this foul air, more open spaces are demanded in our crowded cities. But our exclusive habits prevent our taking or rather yielding the advantages we have in this respect already. For instance, nothing strikes the foreigner with greater astonishment than the

system English people have of making open spaces, filling them with trees, carpeting them with grass, and then *rigidly locking them up* ! The desolation of our city squares, for instance, is distressing to the last degree. Not a soul is seen within them. Possibly the effigy of some departed warrior, in a dilapidated condition, stands sentry over some sooty sparrows, and that is all. And yet these open spaces are capable of being made highly conducive to the public health at a little expense. Let us hope that the really valuable example set by Baron Grant in planting afresh Leicester Square, supplying it with seats, *and throwing down the rails* to all comers, and rendering it a place of real rest to the tired traveller, will be speedily followed. Why should we not also have the place enlivened with some refreshment counters ? Are the public-houses the only places in which the public should be allowed to drink on a hot day ? Possibly ginger-beer and lemonade would be preferred if the traveller were allowed to sit beneath the cool shade of a tree, instead of in a bar-parlour amid the fumes of stale tobacco and stale beer. The teetotallers should work this idea, it is worth putting in practice. What we ask would our French or Belgian neighbours have made of these city squares now standing in such miserable isolation in our midst ! It makes us ashamed of the name of Englishmen, to see such spectacles of gross selfishness standing as a reproach to us in an

age in which, within a stone's throw, children have been declared to have died simply from want of good air.

It is true these fenced spaces are private property—it is not our habit, unfortunately, to secure an open space as they do abroad—and the rights of the owners have to be consulted. But, surely, they are not to stand thus desolate for ever, a very mockery to passers-by? Would it not be a wise proceeding for the Metropolitan Board of Works to negotiate for the opening of some of these imprisoned gardens, some of the Bloomsbury enclosures for example, engaging to purchase the sulky and exclusive right of isolation, and make arrangement to do as a spirited citizen has already done, transform a spectacle of reproach into a real pleasance, at the public expense? Such open spaces cannot be looked upon as lungs so long as the people are shut out from enjoying themselves in their midst. Mr. Carden, the civil engineer, has written a very clever pamphlet, in which he shows that the bricks and mortar are outgrowing the open spaces in London; and what is true of London, is also true of all the progressing cities in the empire. Not only are we crowding more houses on the same amount of ground than we used to do, in consequence of the enormously enhanced value of the ground, but we are building them vastly higher; consequently, the air is doubly vitiated, for

there are more to breathe, and there is less oxygen to be breathed. This system of condensation and elevation cannot go on increasing without manifest injury to the public health. Room to breathe is being curtailed every day. The houses of the working-classes are mere poison gasometers. Is it not shameful that our civil engineers are such dolts that they cannot draw up building plans which shall prove sufficiently working to enable the company established for improving the dwellings of the working-classes to put in practice their too long delayed benevolent scheme!!! It seems incredible, and is only an example of how little in earnest we are in the recent movement towards sanitary improvement.

Even the past shames us with its rule of thumb methods. Let the reader take an old map of London of the time of Elizabeth; let him note the vast number of one-storied houses, and the great gaps between them filled with gardens and enclosures, and then compare it with a map of the present day, in which he see that the bricks are packed closer than in a brickyard, and out of the 78,000 acres which form the present area of London, there are only 2060 open spaces secured to the people! We cannot help coming to the conclusion that as far as the demand of air space is concerned, we have vastly retrograded from the days of our forefathers.

And even this difference against us is greatly enhanced when we remember that vastly increased number of people living there per acre. It is true, in the city proper, the majority fly away by night "to fresh fields and pastures new," but all the heat and toil of the day is spent amid its vitiated air. The poor, it must be remembered, have not even this daily change of atmosphere. At the eastern extremity of the metropolis, where the air is at its worst, the people have no escape; here, where the workers are the most numerous, the jaded people have not room to breathe or grow; here we expect and find pestilence, at times deadly, and the general average of health low. Unless the ground is sufficiently cleared, men no more than trees can flourish. In a word, the axe-man speedily finds a remedy, and the sanitarian must do the like, unless we rate human life less than that of the vegetable. At night, at least after working-hours, this clearance may be made; and we trust to see, ere long, country-houses for working-men, and more cheap trains to take them "out into the clear." When we come to consider the means by which the medical officer of health, sitting in his office in London, manages to survey the health conditions of the country, we cannot help being struck by its insufficiency, which he only too well knows, and has not failed to make known to those in higher authority under whom he acts. Death is the marker who tells him how the game goes. To

the returns of the Registrar-General he has to apply to discover the place where any serious epidemic has arisen. It is quite clear that this is a curious agency for preventive medicine to employ. In the first place, there may be a disease of a serious character so rarely ending in death, that it may by this roundabout method never come within the knowledge of the medical officer of health. Indeed, we are informed by him, in his sixth report, that it was two years before he became aware of the presence in the country of diphtheria, a new disease, which caused much suffering but little mortality. In many epidemics a very mild form of attack is the precursor of a very severe mortal scourge. Thus diarrhoea is the precursor of cholera and of typhoid fever. Yet by our present system of saving life by means of these death-warnings, the one disease may grow into the other before the preventive medicine can be brought into play.

It is quite clear that the time has come when there should be a commencement, at all events, of a disease-return as well as of a death-rate. If we knew the first beginnings of epidemics, there are many of them we may kill at once. If the first case of Asiatic cholera, for instance, could be isolated, the seeds by which thousands of deaths are sown broadcast may be at once destroyed.

As far as the metropolis is concerned, we have weekly returns of all deaths from epidemic causes, and

from the country the Registrar-General has lately commenced quarterly returns. This, although a great advance upon the old state of things, when it was fully two years before the country returns were available, is still too late for the purpose of immediate action. Mr. Simon has suggested that a tentative process, in the direction of making a disease-return, would be to obtain returns from all hospitals and from the poor-law medical officers. In this country there is such a jealousy of any interference on the part of the State with individual action, that it is probable a gradual initiation, by means of these returns from the public charities, would be the best means of making the public familiar with new demands of this kind. As, however, there is no mention of names in such a return, we can scarcely see what objection there can be to an arrangement so obviously demanded in the interests of the public health, were we not warned by the fanatical outcry against the Compulsory Vaccination Act.

We cannot, without regret, refer to the outrageous opposition this sanitary measure has called forth, inasmuch as it denotes a public ignorance on the part of even educated men against which it seems as difficult to contend as against disease itself. There is not in the whole range of human discovery a more triumphant victory of life over death than is the great discovery of Jenner, yet, in the latter portion of the nine-

teenth century, after nearly a hundred years of successful trial, after the extinction of the greatest plague which scourged our ancestors—the records of which some people have too soon forgotten,—we find an agitation on foot to prove that the discovery is only a delusion and a snare !

Under the influence of this agitation, we see women making martyrs of themselves to the extent of repeated fines, and even imprisonment, rather than bring their children to the public vaccinators, and raving before the police magistrates who inflicted the penalties, as though they were instrumental in forcing them to destroy rather than to fence their children against a frightful disease, and this, be it remembered, when the death-rate from small-pox in London alone was at the rate of a thousand a month from this scourge, or a thousand wilful murders, to speak the plain truth !

It certainly seems needless at this time of day to attempt to refute the falsehoods which have been stated with reference to the evil effects of vaccination. The question of the communicability of disease by means of the true Jennerian vesicle, has been experimentally tried by the surgeon of the Children's Hospital, and he never, on any occasion, knew of disease being transmitted in his vaccinations. The experience of the medical authority in this country, best known as an observer in the treatment of communicable

disease, Mr. Jonathan Hutchinson, also gives a direct negative to the rash assertion, in these words, in answer to a question from Mr. Simon : “ In the thirteen years and upwards which have passed since I made the communication which is given at page 73 of the ‘ Papers relating to the History and Practice of Vaccination,’ I have not met with a single case, either at the Hospital for Diseases of the Skin or elsewhere, in which I have had any reason to believe or suspect that contagious disease has been communicated by vaccination.”

It need not be explained that infectious matter could be passed into the circulation, on a lancet in the hands of a wilful or ignorant person, with the result of contaminating it with a foul taint, but this would not be vaccinating with a true Jennerian vesicle, and could by no means be ascribed to the true principle of vaccination ; to shew the care taken by the Government to ensure the perfect practice of which, as the public safeguard against such an occurrence happening, not only are the medical men appointed as vaccinators, educated in the art, but they are superseded from time to time, and such a record is kept of the lymph, furnished by the National Vaccination Institution, and of the health of each child from which a supply has been taken, that the excellence of it can be verified at a moment’s notice—a very valuable arrangement as it happens, inasmuch as several children said to have been tainted

by foul matter have been proved by this record to have been protected by a true Jennerian vesicle.

Pure water and air, and we may lastly add, pure food, form the triangle upon which healthy life is mainly built. It is quite as difficult to make good flesh and blood out of adulterated nourishment, as it was for them of old to make bricks without straw. Yet if we come to examine the food and alcoholic drink of the people, we find that adulteration is the rule rather than the exception. Since the day when that celebrated work, 'Death in the Pot,' was written, our cutting tradesmen have gone on adulterating and deteriorating our food, and, therefore, enfeebling the fibre of our people. At the present high price of meat, the butcher's joint is almost proscribed to the working man, and even if it were not, it would be difficult for the most cunning in the art to adulterate a joint, but as the labourer will have meat in some form, he is constrained to have it in a shape commensurate with his means, sausages and polonies made of chopped meat being often used. In these articles the door is at once opened to the vilest adulterations and refuse. Diseased meat, it is needless to say, is largely used in all these prepared foods. Mr. Harper, for instance, when he was under examination by the Smithfield Market Commissioners in 1850, made the following statement with respect to diseased meat:—"It is purchased by the soup shops, sausage-makers, the

alamode-beef and meat-pie shops, etc. There is one soup shop, I believe, doing five hundred pounds per week in diseased meat. This firm has also a large foreign trade (thank goodness!). The trade in diseased meat is very alarming, as anything in the shape of flesh can be sold at about one penny per pound, or eighteen pence per stone. . . . I am certain if one hundred carcasses were lying dead in the neighbourhood of London, I could get them all sold within twenty-four hours. *It don't matter what they died of."*

When Mr. Harper gave this evidence beef and mutton were three pence a pound cheaper than they are now. The foot-and-mouth disease has caused a large part of the increase of price, and thrown a larger supply of diseased meat upon the market, which the working man, by reason of his necessities, is forced to buy and eat. Were it not for the happy introduction of Australian meat into this country, with even the foregoing sources of animal food, the poor man would be stinted in his muscle maker; but we are given to understand that this splendid food is refused through wretched ignorance, and sausage meat, such as we have described, is consumed in increasing quantities. Now let us see what the bread is made of, to go with this diseased meat.

Cheap bread is invariably made of damaged flour; to improve the bread made of such flour the trade use a preparation termed "hards" and "stuff," being

nothing less than alum and salt. The latter may not be an objectionable ingredient (the publican, no doubt, will approve of it as bringing customers to his shop) ; but alum, when taken constantly, is deleterious to the stomach, and has the effect of making the bread in the course of manufacture take up a large portion of water. Thus our staff of life, selling in the working-man's neighbourhood, is both noxiously adulterated, and dear by reason of its superfluous amount of water.

The beer the labourer drinks to wash it down is also falsified. It has been asserted by those giving evidence before a committee of the House of Commons, that brewers' druggists (a recognised trade) furnish publicans with salts of steel and *coccus indicus*, by way of improving the flavour and appearance of beer ; but salt and tobacco are more generally used for the purpose of increasing the thirst of the drinker. There is another source of injurious flavouring in beer drawn over the counter, which is worthy of notice. The pumping-machine by which the beer is drawn from the cellar, necessitates the use of long leaden pipes, through which it must be drawn. The effect of the acidity in the liquor causes a certain oxidation to take place in the pipes, hence the first glass or two that is drawn off is apparently thrown away down the grating, but these deleterious "draws" ultimately find their way again into the liquor sold to the labouring

man. The spirituous liquors are adulterated with "flavourings," such as oil of cinnamon, cayenne pepper, and we have it on good authority that oil of vitriol is sometimes used ; whilst brandy is made up for sale by the addition of raisin wine, grains of paradise, cherry-laurel water, and spirit of almond cake. In fact, the cheaper alcoholic liquors have only the appearance of being what they are called, and often hide beneath their simulation an ugly toad in the form of some poisonous adulteration.

But the women who purchase at "cutting shops" suffer as much as their husbands. The green tea is "bloomed" with Prussian blue, turmeric, and French chalk ; very often teas are mixed with old leaves, dried, recurled, and flavoured. Coffee is adulterated with chicory, and sometimes its quantity is enhanced with oak and mahogany sawdust, roasted acorns, and baked horses' and bullocks' livers. Even the milk in poor, and as, indeed, we have learned from recent police cases, even in the best neighbourhoods, is adulterated. The cream is, as a matter of course, skimmed off and sold at a special price, but its appearance in the milk is imitated by swinging round a ball of annatto in the can, which, together with a little flour, starch, and treacle, gives some imitation of the abstracted cream. The sugar, again, especially the coarser brown kind used in coffee, is often infested with an animalcule of the acari genus, and they are often so thick as to cause

the mass to move perceptibly to the naked eye. It is this insect which gives the skin disease, which those who are accustomed to handle this sugar are known to be subject to. But it is not only the poorer classes who are liable to these adulterations injurious to health ; some of the condiments used by the upper ten thousand are equally liable to them. Thus we are told that cayenne pepper is adulterated with red lead, and curry powder is adulterated with the same pernicious colouring matter. Even the pickles, when of a vivid green colour, are prepared by boiling them with copper. Indeed, we know not where the poisoning nuisance ends. Bottled fruit is equally deleterious from the same cause, and the poor little children who are taken by the eye when they purchase sweets, are often deluded into dangerous illness ; arsenite of copper, chromate of lead, and vermilion, yielding the various colours which are made to imitate the bloom and vivid green of delicate fruits. The amount of infantile disease which arises from this wicked sophistication is incalculable, and a far more stringent method of inspection than is at present practised in the interest of the public is demanded.

The establishment of the new Local Government Board has at last been settled. It will confer, we hope, on sanitary science great assistance, by reason of the consolidation of the various Acts which are more or less concerned in its work. The machinery hitherto

divided between the office of the Secretary of State and the Privy Council is now pieced together, and under an able president will act successfully. The absorption of the Poor Law Board into this new office will, we trust, bring the medical officer of Health in more direct communication with the medical officers of the Poor-law, an army of trained practitioners which cannot fail to be of the utmost value in carrying out sanitary arrangements from a central authority. This is, we trust, but the first step towards the erection of a Public Health Department, a position which we think the great importance of the subject demands. The advantage of having a president appointed by Her Majesty will, without doubt, give a prominence to the new board which will enable it to work with greater authority, and we hope to find that a concentration of power in one directing hand, will enable the sanitary element of the board to make a stronger mark upon disease than it has hitherto done, hampered as it has been by a want of direct action, and with a but too loosely constructed power of working machinery.

## WHIMS AND OMENS.

IN the breasts of nearly all men, there lingers a belief in odd portents, or omens, which exercises in many cases a very important influence over their lives. Let us take the well-known case of Napoleon's star. M. Passy at the meeting of the ' Académie des Sciences Morale et Politique,' according to M. Boisement, had the following anecdote from General Rapp himself, who, on his return from the siege of Dantzic, having occasion to speak to the Emperor, entered his cabinet without being announced. He found him in such profound meditation that his entrance was not noticed. The General, seeing that he did not move, was afraid he might be indisposed, and purposely made a noise. Napoleon immediately turned round, and seizing Rapp by the arm, pointed to the heavens, saying, " Do you

see that?" The General made no reply. Being interrogated a second time, he answered that he perceived nothing. "What!" responded the Emperor, "you did not discover it? It is my star; it is immediately in front of you, most brilliant." And becoming gradually more excited, he exclaimed, "It has never abandoned me. I behold it on all great occasions. It commands me to advance, and that to me is a sure sign of success." This illusion of the sense may be explained by some as a symptom of one of those impending epileptic attacks to which it is well known he was subject. Whether this was the case or not is, however, beside the question, inasmuch as similar signs have in the imagination appeared to great men in all ages, and our object here is merely to draw attention to the universality of the belief in these omens. Our own gallant Nelson had a belief in them, we know, by the horseshoe he had nailed to the mainmast of the 'Victory,' (of which his coffin was made). And to quote another and a very different class of mind from that of either of the great men mentioned, as influenced by the same consideration for the ruling of trifles, we may refer to the singular habit of Dr. Johnson, described by Boswell, of never entering a doorway without counting a certain number of steps, and so judging the distance the last step would fall upon the threshold of the door with a certain foot. So particular was Johnson in this respect, that on

more than one occasion when he had failed to time himself, he returned to correct his steps.

Nearly every superstition can be traced back to the earliest periods, The merest trifles that children amuse themselves with, amused and had an influence on the minds of the earliest races. The children who twirl the cup to tell their fortunes by the disposition of the tea-leaves little imagine that it is the divining cup of Joseph and his brethren; neither do young girls when they suspend a wedding ring by a hair in a glass know that Roman girls did the same two thousand years ago.

Sailors think it unlucky to sail from a port on a voyage on a Friday. There is a story afloat in Bristol that a shipowner, determined to disprove this superstition, had a ship built and launched on a Friday, named Friday, with a captain and first mate born on a Friday; and the triumphant report of the sailors was that she sailed on a Friday and was never heard of again! There was a very common superstition in the days of the Tudors, that if an image of a person was made in wax, with a pin stuck through the left side, and the same were exposed to heat, the person so represented would melt away when placed before a fire as fast as the wax image did. During Queen Elizabeth's reign the celebrated Dr. Dee, the astrologer, was sent for one morning by Her Majesty's ministers to prevent the mischief which they believed was in-

tended against her, by reason of an image of wax in her form found in Lincoln's Inn Fields. We mention this old superstition in order to state that, even in the present day, such images are still made for the purpose of obtaining money out of poor credulous women, who believe the 'cunning women' and 'wise men' who make them have absolute power over their bodies by means of this device.

A very curious police case that occurred at the Worship Street police court only a few years back, proves that even in London there are women who earn a livelihood by pretending to take away spells placed upon the people. The wife of a copper-smith, described as a ladylike-looking personage, appeared before the sitting magistrate and charged another woman with thus defrauding her. When asked by the magistrate what the woman had done to her, she made the following statement:—

"I went to Mrs. Macdonald (the Defendant), who said 'You appear ill,' and I told her I was. We had some conversation about it, and she told me that a person was doing me an injury, and said, 'If you will have some of my powders they will relieve you, but they are sixpence each.' I told her of course I did not mind that, and she burned ten of them."

"Then she did not give them to you to take home?"

"Oh, no; of course not. She put them into the

fire before my face, and they all cracked, blazed, burned, and bounced."

"What object did she say they were intended to effect?"

"Oh, she said they would torment the person who was injuring me."

"And did you feel any better for the powders being administered in that way?"

"Oh, yes, I did feel better; but, mind, I don't believe it lies so much in the powders as in the words she uses. I think it's what she says when she burns them that does the good."

"Indeed. Then what were the words she used?"

"Oh, I don't know. She took care that I should not hear those, or of course I should be as wise as she herself. She did not even mutter them."

"Then there was no incantation?"

"Why, no."

"Well then, have you brought her here because you feel better, or what?"

"Oh, no; I feel worse again—worse every day. I only felt better the first day I went. The fact is, I have a relative who is coming into a large fortune, and she wants to get rid of me, so she goes to Mrs. Macdonald and has powders the same as I do, and of course they torment me whenever Mrs. Macdonald burns them for her. She knows that's true, too, for when I went to her another time she told me that the knowledge got

made her so ill that she was obliged to leave her husband's side in the middle of the night and burn a powder to get rid of the torments that she herself suffered from it."

"And how often did you go to her?"

"Oh! seven or eight times, I should think."

The magistrate having inquired of the police officer whether many persons believed in the prisoner's powers, that functionary replied, "There are a great number, sir, who believe in this."

There is something exceedingly humorous in this old woman aggravating the quarrel between two relatives by burning powders for their mutual torment. It may be a laughing matter now, but in the days of King James I. this cunning woman would in all probability have been burnt for a witch.

Ghosts are no longer thoroughly believed in by persons dwelling in what may be termed the home counties. The schoolmaster has been abroad too long, and the people are growing sceptical on most matters which do not appeal to their reason; but in the northern counties, and especially in Lancashire, where there are so many old mansions, the "boggart," as it is called, still lives and flourishes in the belief of the country people. The "boggart" does not necessarily take the human form. Sometimes it appears in the shape of a black dog, or rabbit, or bear; but, as a rule, the boggart of Lancashire is merely a teasing mischievous

fellow, a sort of Robin Goodfellow. The old-timbered halls of this county contracted boggarts, as a matter of course. They were a testimony to the age of the family inhabiting them ; and we question whether any old Lancashire hall would not fetch more by auction for possessing its familiar. The boggart was, in fact, to the old timber-built mansion what crust and cobwebs are to old port wine—a testimony to its genuine age.

What an exceedingly interesting chapter could be written upon charms and spells !. Very many of these are in doggrel verse. The ladybird charm is well known. The charm to bless the bed is also commonly used by children throughout England to this day. The appearance of the new moon calls forth the invocation and tender inquiry from young maids respecting their lovers. There is a charm quoted in ‘Lancashire Folk Lore’ against epilepsy, which is new to us. This is evidently very old, but it still holds its ground in Devonshire, where a vast number of superstitions still linger from the old time. The charm is written upon parchment, and is hung upon the person of the afflicted one.

Some charms work through their influence upon the minds of their patients : a poor gipsy-boy, in our own service, told us he was cured of fits by his mother hanging living toads round his neck and allowing them to remain there until they died. It is just pos-

sible that in some slight affections which do not depend upon brain disease, the impressions made upon the minds of patients by such a recipe may be useful. It is quite certain, however, that epilepsy will not be cured by any such method. It was long held by some of the elder physicians that some forms of mental disease could be cured by the effect of sudden fright. It was proposed to put such poor afflicted ones down wells with vipers; to give them sudden shocks by dropping them suddenly with a horrid noise of chains through trap-doors into cold water; and will it be believed?—not longer ago than December, 1874, this proposition was renewed by certain physicians who ought to have known better, than to have suggested the revival of such nonsense.

Some charms are supposed to actually transfer a blemish from one person to another, provided the latter is unlucky enough to pick up the agent by which the charm was worked. Take the following, for instance, from 'Notes and Queries':—"For warts, rub them with a cinder; and this, tied up in a paper, and dropped where four roads meet, will transfer the warts to whomsoever opens the paper."

The royal power of "touching" for the king's evil was firmly believed in during the reigns of the early kings. The last monarch who exercised her healing prerogative was Queen Anne; and Samuel Johnson, when a child, received the royal touch. In Roby's

‘Traditions of Lancashire,’ a tale is told of the healing power of a dead man’s hand. This relic is still kept by a priest now residing near Garswood, “preserved with great care in a white silk bag. It is resorted to by many diseased persons; and many wonderful cures are reported to have been performed by this saintly relic. It is said to be the hand of Father Arrowsmith, a priest alleged to have been put to death at Lancaster for his religious opinions, in the reign of William III. The story goes that when about to suffer, he desired his spiritual attendant to cut off his right hand, which would then have the power to work miraculous cures in those who had the faith to believe in its efficacy. Not many years ago, a female sick with the small-pox had the dead hand lying in bed with her every night for six weeks, in order to effect her recovery, which afterwards took place.”

We made a journey some years ago to St. Winefred’s Well, in North Wales, to see the beautiful Tudor building in which the miraculous spring is enclosed. The healing power of this spring is believed in most implicitly by all the many pilgrims who resort to it; and they are numerous, it is clear, by the number of crutches, hand-barrows, eye-patches, and other easements of the lame, the halt, and the blind, who have resorted to its healing waters, and left these relics behind, secured in the open stone-work of its beautiful roof. However we may laugh at the cre-

dulity of the poor people who have left their testimony behind them in this manner, nevertheless it is a singular proof that faith is still lively in the land, notwithstanding our utilitarian tendencies.

The old superstition of the divination by the Bible and the key, is often resorted to by schoolboys—or at least it was in the schooldays of the writer. The key was bound on to the cover of the Bible, and when any particular person or supposed culprit had to be discovered, all the boys concerned stood in a circle round the one who held the book up depending from a string; a vigorous twirl was given to the volume, and the person to whom the key pointed, when it stopped, was supposed to be the guilty party. Not long since, Dr. Ashbourne, by the aid of a crystal placed at the nape of people's necks, professed to divine their thoughts, and even called within its translucent sphere images of persons that were asked for. Every one pretends to laugh at the absurdity of putting faith in the numberless omens, charms, etc., that have been implanted in us in the nursery; but many, nevertheless, pay the practical homage of attending to them in secret. Some, for instance, walk out in the road in preference to walking under a ladder; with others, a black dog following them is a sign of coming luck. These little weaknesses, although outwardly disclaimed, show how deep in our nature must be planted the sense of a fate over which we have no

control, and, we may add, the indelible nature of the impression made upon us by our nurses. The first seeds planted in the mind of the little child grow to trees that are never rooted up as long as we live; hence the value of a judicious and well-instructed nurse. There is scarcely a living person, we believe, who has not some whim or other, some token, by which he is guided in matters he may have in hand. There are a great many people in the world who treat with the greatest outward contempt any form of superstition, who yet, if they could be narrowly watched in their inmost thoughts, would give evidence of being actuated by the most trivial matters, even in the great concerns of life. Great philosophers may be found who accept certain favourite numbers as good omens of success. They do not attempt to give any reason for the belief that is in them, further than that, as certain events have turned out favourably in conjunction with those numbers, it is likely they will do so again. The only explanation of the matter is, that underlying our religious faith a vast amount of paganism is still remaining; and the explanation is strengthened by the known fact, that the least cultivated and enlightened countryman is a greater believer in the grosser superstitions than the citizen, who, by the time he reaches manhood, has had a great many of the powerful impressions, instilled into him in the nursery, dispelled. The "charms" of the

town-bred young lady take the form of very pretty jewellery; but the agriculturists read Culpepper's 'Herbal' in greater numbers than all the other works on the same subject put together; and Napoleon's 'Book of Fate' is in the hands of every servant girl. To use the language of a writer in a Review, when speaking of the superstitions of Cornwall:—"Strip off the romantic and the amusing, it is, in truth, a rather humiliating topic to dwell on. Superstition lives on with little abatement of vitality in the human heart; in the lower classes it wears its old fashions with very slow alterations; in the higher, it changes them with the rapidity of modes in the fashionable circles."

## ECCENTRIC CATS.

IN the 'Plymouth Journal' for the year 1827, a writer states, "That there is now at the Battery in the Devil's Point, a cat which is an expert catcher of fish, being in the constant habit of diving into the sea and bringing up the fish alive in her mouth, and depositing them in the guard-room for the use of the sailors." This remarkable cat was indirectly trained by her instructors to sport in this way, having long been accustomed to dive into the sea after water-rats. "Her love for the water," says the writer, "was as great as that of any Newfoundland dog." This anecdote proves how the nature of the beast may be changed by circumstances.

No doubt had she had kittens, and fish and water-rats being the only food they could obtain, they might have followed the mother's curious habit, and in course

of time, the instinct becoming hereditary, there might have been a race of sea-diving cats ! Cats can reason, or put two and two together, in a quiet way. Sam Slick tells a tale touching this faculty, which might not be believed were it not backed up by other unimpeachable evidence. A servant continually entering the master's library upon the summons of a bell, and as continually told that it had not been rung, persisting in saying that he had heard it, the domestics began to suspect that the house was haunted, and so it turned out to be—not by a ghost, however, but by a cat, who, wishing the company of her master, and not being able to obtain admission by reason of the closed door, must have noticed that when a certain bell within her reach rung, it was opened by the servant. Puss noticing cause and effect, used to ring the bell, and always ran to the door and entered when he did ; the fact of their simultaneous entry leading to the discovery of her cunning trick. This, it will be said, was but a Sam Slickism ; but here is a still cleverer trick, which is related of an Angora cat belonging to a Carthusian Monastery at Paris. This cat having observed that the cook always answered a certain bell just before the dinners, portioned out in plates, were served out to the monks, leaving them in consequence unprotected, had wit enough to take advantage of this fact, for she used to ring the bell outside the kitchen door, watch the cook off guard, spring through the

window, help herself to a portion, and then return before he had time to come back !

We have shown the capabilities of a fish-catching cat, but a trap-setting puss is more curious still. A writer tells us that a tom-cat at Callendar, having been observed to carry off a piece of beef, as the servant supposed, for the vulgar purpose of eating it, the latter followed the animal, and observed that it went to the corner of a yard and laid the morsel down near where there was a rat-hole ; having done so, the cat hid herself. Presently the rat came out, and was dragging away the meat, when the cat pounced upon him. No biped could have caught the animal with more skill. It is quite clear that rat flesh was a greater delicacy than the beef, unless we are to suppose a zest was added to it from the fact of its being made gamey by the trouble of sporting for it. In support of this latter theory we have an anecdote by the Rev. Mr. Wood, with respect to the Mincing Lane cat, which proves that there is very fine hunting ground in the city. It appeared that a certain old black tom, domiciled in a cellar used for storing goods, had suffered various mishaps from the cellarmen crushing him in moving about the wine cases ; his ribs had been fractured, and he had otherwise been disabled from catching mice. But age did not rob him of his hunting spirit or his love of the game when caught. It happened that he met and fraternised with a young

cat, which he taught by his own experience, to avoid the men and the moving merchandise ; and it appeared that he also made a bargain with his friend, by which his young energies were devoted to catching mice which suited the epicurian taste of the senior, he in return repaying him by making over a certain allowance of the bones and cat's meat. The exchange, we are told, was regularly made in all good faith.

Cats have a plentiful store of cunning, and know how to obtain by artifice what they cannot by stealth. Mrs. Siddons, having a favourite cat that happened to hurt its leg, felt constrained whilst it was lame, to give it its daily milk. The cat after a time got well, but she evidently imagined that lameness was an advantage that was useful to her, consequently she shammed whenever she saw her mistress, holding up her paw, as though it caused her pain to put it to the ground. But this animal had a virtue besides that of taking care of her inner cat. Her affection for her young was not inferior to that of many of the higher animals, not even to that of man himself.

A lady had two cats, black and white. The black cat on one occasion when her nursing power was feeble, carried her kitten to the white one, who was herself nursing at the time, and who took upon herself for the sake of her friend, the maternal duties, bringing it up with all the care of her own kittens.

The maternal instinct is so great, that we find in many animals it overrides all questions of kind.

The happy family we used to see about the streets, showed us puss in her most tender and humane moods. The rats and mice were always to be found nestling together comfortably beneath her, whilst the starling and the blackbird perched upon her back and head; but we felt all this security was very doubtful, and we have heard it reported that on one occasion, the showman having got drunk, and being locked up for two or three days, hunger destroyed all this happy paradise; the dog attacked the rat and made a meal of him, the cat ate up the mouse, and the owl finished up the birds, and the dog, the cat, and the owl were about to settle matters between them, when the man, released from custody, came to restore peace.

According to Mr. Ross, it is stated in a German magazine, that a Mr. Hecart trained a wild cat to take care of a tame sparrow. The animal did his duty so conscientiously, that when another cat attacked his charge he defended it most vigorously; the same authority gives an instance of a cat trained like a dog to keep watch over a yard containing some sparrows, blackbirds, partridges, and a hare.

Cats sometimes behave like dogs. The writer possessed an animal that used to come to his whistle just as a terrier would, and in the night time, when dogs

and pedestrians were not about, used to accompany him in his walks in May Fair.

This cat was not formed like others of its species. It was a tabby, with rather longish hair and with a thick tail, which was not more than six inches long. How the remainder was lost was a question ; but from its extreme irritability when its tip was touched, a butcher-boy's chopper was suspected. The cat was odd in other ways ; when her master was at his desk writing, she would always select a small piece of writing-paper on which she sat down, no doubt putting herself on a literary footing with him. Her diet was also extraordinary ; she would eat pickles and drink brandy-and-water. One day she rose suddenly and sprang up the chimney, a fire burning in the grate all the time. A couple of hundred years ago the writer would without doubt have been burned as a wizard for keeping a familiar. The cat when she found the top of the register too hot for her feet came down, a little blacker than when she went up. One day, however, poor puss suddenly rushed round the room in a circle for a few seconds, and then fell down dead. This finale explained many of her peculiarities when alive. She suffered from epileptic fits, and these always affect the brain in a singular manner, and no doubt accounted for the depraved nature of her appetite.

Mr. Ross mentions a puss belonging to his mistress, who was in the habit of living in furnished houses, which she was accustomed to change very often; on these occasions the cat was removed in a hamper, out of which it stepped when it was opened, looked about it, and in half an hour after inspecting the premises, would sit down on the hearthrug as contentedly as though it had been in the house all its life.

Tortoiseshell toms, in popular fancy, are considered very rare and valuable animals indeed. Mr. Bartlett, the superintendent of the Zoological Gardens, Regent's Park, tells us that scarcely a month passes without some one bringing him a specimen of this animal, sometimes from long distances, and demanding a large sum for it. He says they are quite disappointed and somewhat offended at being told that their value is fictitious, and go away with the idea that he must be a pretty superintendent not to know his business better.

The Manx cat is a very extraordinary-looking animal, with only a bob in place of a tail. They are more bony and angular than the common cat, and they may well be taken by superstitious persons to be the familiars of the old witches. There are many diabolical tricks attributed to cats of which they are wholly guiltless. Some persons will never leave a cat in a room with a baby lest it should suck the

child's breath. The gross absurdity of such a fear is apparent enough to all naturalists. Even if the cat were inclined to "suck the wind" in such an extraordinary manner, the anatomical arrangement of her mouth would not permit her to do so. There is another idea concerning cats, which is by no means so fanciful. Their presence in rooms, is exceedingly obnoxious to some persons. They seem to be aware of the animal's being near, either by scent or by some electrical influence possessed by them, which exerts a power over their nervous system. We have known such persons to show the utmost uneasiness on these occasions, and most positively to declare that, although undiscovered, the animal must be in the room, and such has always proved to be the case.

Mr. Ross gives the following quotation from the autobiography of Miss Cornelia Knight, lady companion to the Princess Charlotte of Wales :—

"An old woman who died a few years ago in Ireland had a nephew to whom she left by will all she possessed. She happened to have a favourite cat, which never left her, and even remained by the corpse after her death. After the will was read in the adjoining room, on opening the door the cat sprang at the nephew, seized him by the throat, and was with difficulty prevented from strangling him. The man

died eighteen months after this scene, and on his death-bed confessed that he had murdered his aunt to get possession of her money."

Here is another story which would go to prove that the cat can not only have very strong affections, but that she is capable of giving signs of distress at the perpetration of outrages upon those she is attached to.

"A woman was murdered at Lyons, and when the body was found weltering in blood a large white cat was seen mounted on the cornice of the cupboard. She sat motionless, her eye fixed upon the corpse, and her whole attitude expressing horror and affright. Next morning she was still found there ; and when the room was filled with the officers of justice, neither the clattering of the soldiers' arms nor the loud talking disturbed her or frightened her away. As soon, however, as the suspected persons were brought in, her eyes glared with fury, and her hair bristled. She darted into the middle of the room, when she stopped for a moment to gaze upon them, and then fled precipitously. The faces of the assassins showed for the first time signs of guilt. They were afterwards brought to trial, condemned, and before execution confessed."

There are many other well-authenticated stories in which cats have displayed similar signs of animosity at the sight of persons who have wrought injury to

those they have loved, and we have no reason to doubt that they are quite as capable as the dog of participating in the emotions and feelings that we are too apt to imagine the human being mainly engrosses.

## TOYS OF THE DAY.

EVERYTHING progresses in this world, in England at least, and especially a toy. Whatever in our old days we may forget, the games of our childhood are not among the number. The father of a family when he sees his boys at play is apt to get disdainful of modern contrivances, and to revert to his youth, when "toys were toys," and the elaborate contrivances of the present day were unthought of. For instance, what should we—of course we are addressing an old boy—have thought of having a steam-engine solidly made, and a working model to boot? The idea would have amazed us, and yet steam-engines and model locomotives now meet us in every window. These are certainly not toys to *smash*, but they have their value, and in many cases are doubtless an educational element, which influences the tastes of the future

man. In Continental nations, and especially in France, the nursery is a miniature armoury. Swords and pistols, guns and drums, breastplates, etc., train the useful tastes towards the end to which ambition ultimately leads them—*i.e.*, military life. The Englishman, more peaceful in his desires, turns his thoughts rather to commerce and engineering. For ages the ship has been the pet toy of every healthy boy. To cut out a vessel, a three-master, and then sail it, is the height of his felicity. No doubt some mimic craft has been the subtle influence which has sent many a boy to sea. Who shall say, then, that the model steam-engine may not tend to strengthen in the boys of the present that strong hereditary “strain” that is in them towards mechanical pursuits? The English engineer is sought for all over the world. If engineers are to be bred, these pieces of mechanism, requiring thought and care, are no doubt powerful teaching-powers towards the desired end. But when we refer to toys as toys merely, or things to amuse without ulterior aim, we cannot fail to see that the toys of the past generation had their differences from those of the present day. Writing as an old boy, we may say that our toys were stronger and coarser in their make, and far more primitive in their construction. Let us instance the hoop. We cannot help feeling as we see our sons running along a thin iron hoop with a slim steel hook not bigger than a knitting needle, that our

hoops—jolly wooden ones, struck with a solid stick, were far more enjoyable, for hearing as well as sight was better gratified. The jolly bang was more wholesome to the nerves than the sharp ring of iron upon iron with which modern boys are content. Again, the solid boxwood top, affording such opportunities for being split in the pound, was a far more honest toy than the little hollow contrivance of metal that goes with a spring, abolishing the deliberate business of winding up with a string, as all honest tops should be wound. Mechanism in this fast age, even in the games of boyhood, is rapidly taking the place of hard labour. We wonder if cricket will ever come to be played with coach springs and wheel-work, or football played without the aid of good honest human kicking power? At all events, we trust kicking may not be done by machinery, or else our future boys will be speedily reduced to mincemeat. But we must return to the nursery—the toys of the smashing age, rather than to the toys by which lads damage themselves. Toys for the million are peculiar to the age. Wood is by far too dear in this country for their production, consequently the chief seat of their production is in the dense woods of Germany. From out the old sombre pine forests of Thuringia issue the penny boxes of toys destined to make the homes of all Europe ring with joyous laughter—children's tea-things, Noah's arks filled with only the leading

animals, soldiers, etc., and the most "screechingest" articles that ever delighted the urchin's ear and maddened the old folk. How so many pieces as go within these boxes can be made, brought from such a distance, and sold with a profit of a penny is a marvel which can only be understood when the mystery of their manufacture is inquired into. In the first place, the pine wood costs next to nothing; women and children are chiefly employed in their manufacture, and a great speed in their production is obtained by the division of labour, every toy passing through half-a-dozen hands. It would at first sight seem impossible that the lathe should be produced in the production of animals; but here we have an example—a ring of elephants, if we may use the term. All those who have been abroad are familiar with the round rings of bread eight or ten inches in diameter seen in bakers' shops. In a toy factory we saw what at first sight appeared to be one of these, but upon examining it more narrowly we perceived that it was a ring of pine wood turned in a lathe, not exactly in the form of a ring, but in the form of a ring of elephants; there were the trunks, the peculiar-shaped head, and the legs cut round the ring, as it were; and it was evident that the workman had only to split the ring in a sufficient number of segments according to appropriate thickness, to transform the circle into a given number of elephants. These segmental elephants require, of

course, to be rounded and finished by hand ; but the process is most curious, and is applicable to the production of any other animal, and accounts for the cheap rate at which these wondrous toys can be produced. When manufactured, they come into this country by water carriage. Of course, art is out of the question in these penny articles ; but the imagination of children is lively enough to fill up all deficiencies, and, as may be expected, their sale is immense.

But quality is also to be looked for from Germany. Some of the best-modelled toys in the world come from Grünheinscher, in Saxony, where their modelling is attended to in a most artistic manner. Prussia, where schools of art are fast educating the people in all matters of design, is the seat of those elegant little toys in which the details are made in *papier mâché*. In Germany the Government educates its children in the construction of toys, hence the comparative cheapness with which we procure from that country models of interiors made in paper, and coloured to the life. So excellent are some of these little designs, especially of animals, that they are used in this country rather as ornaments than as playthings.

Nuremberg is the great seat of the metal toy trade, such as leaden soldiers in boxes, locomotives, and railroads. Leaden toys as a rule are not to the taste of healthy robust lads ; indoor games seldom are. There is something derogatory and feminine in sitting

round a table setting up toy soldiers. Boys who indulge in such amusements are either weaklings or of an effeminate disposition. It may be said that a love for mechanics would fast be elicited by model steam-engines or locomotives ; but there is no subterfuge here, and no lad but one with a turn for mechanics would crave after these mechanical toys. It is extraordinary the accuracy with which toys of this description are finished. Only in England would the care be taken to complete every detail in the most elaborate of steam-engines ; we do not allude to the tin affairs, which are mere shams—these are of German production,—but the brass specimens we see in the windows of the opticians.

There are some establishments in London where the whole process of constructing these elegant toys is taught. The rough castings ready for the lathe and the bench can be purchased separately, and the youth of a mechanical genius taught to construct these machines ; it is a speciality worthy of note. Perhaps they can scarcely be strictly placed in the category of toys, but we feel certain they afford an amusing training of the mind for pursuits in which large numbers of English lads are pretty sure to be thrown.

The military toys of Germany come mainly from Hesse Cassel. It seems strange that these peaceful people should help to feed the warlike spirit of childhood. The French instinct this way we can account

for ; but we suppose there is a rising warlike spirit in Germany which the people instinctively see, requires fostering.

Strangely enough, the really most artistic toys—wax dolls, such as we see in the windows of the West-end shops ; little model babies, well shaped, with waxen arms and feet,—are home productions. We have been so accustomed in our youthful days to see the hideous things known as Dutch dolls our sisters some thirty years ago were contented with, that the artistic merits of the waxen darlings, which seem rather to have come from the hands of the modeller than from the shop of the artisan, strike us with astonishment. Many of these dolls have real hair, and the eyes are not the staring beads of the old-fashioned sort, but languishing, of different colours, and softly lashed. Indeed, many of the faces are so pretty and delicate in their modelling as to elevate them into real works of art ; and, furthermore, the toilets of these little waxen beauties are not forgotten—miniature combs and brushes, powder pots, and looking-glasses make the nursery complete.

When we have exhausted the toys of the rich and of the middle classes, we ask what are the toys of the poor ? In the sense in which the better class speak of toys, we fear they have none. These we buy of our superfluity, and where is theirs ? What do the poor want of dolls ? Moreover, the homes of the poor are

not inviting enough to promote indoor games, hence we find that they are more inclined to out-of-door games of the usual free class, and their fun and native wit are generally expressed by the aid of a piece of chalk upon a wall or the pavement. "Please to remember the grotto, sir," when oysters first come in, shows that the necessity for halfpence dictates their amusements, and the spectacle of a farthing dip shining through the open grotto work of shells is considered a sufficient trap to secure spare halfpence.

But having descended to the cheapest and most infantine toys of the very indigent, we can at a bound revert to the grander toys of the young men of the day. Do not all of us of a certain age remember the old dandyhorse or velocipede of our youth? We have always looked upon them as one of the features of our youth—one of those mechanical novelties which, in consequence of their own unworthiness had come to grief years ago, and had been transferred to the lumber room, where time keeps all abortive inventions. But it has arisen again in a new form, and has turned out one of the most practical inventions of the day. The original dandyhorse was a Parisian invention of the year 1818, and the drawings of George Cruikshank, which may be seen in the British Museum,\* are evidence sufficient of the reason of its failure. It was a

\* We have gathered these particulars from an amusing pamphlet by Tinsley Brothers, on 'Bicycling, its Rise and Development,' 1864.

heavy, lumbering wooden machine, weighing at least a hundredweight, and was propelled by the feet, consequently it was an invention to walk in the dirt by the aid of machinery. It consequently failed, and it was not until 1862 that it began to show life once more, when the very valuable addition of the crank action applied to the wheel, which at once lifted the rider out of the mud and into the saddle, gave new life to the machine. The general power of the machine was not very different from that of the old one; moreover, it was still built of wood, and was consequently lumbering in appearance, and also very weighty in fact. In Paris the next great improvement was made, and wood was discarded for iron, and the driving wheel was made at least double the circumference of the following wheel, and the whole appearance of the machine was elegant, though fragile. The enormous increase in the power of these machines soon made it evident that from a mere toy of childhood the bicycle had ascended to one of the most practical inventions of the day. Stanton, the champion bicyclist, has run 106 miles within eight hours; this is more than has been done by any horse, of course, and the power of doing long distances, as well as short bunts, has been shown by the match from Knightsbridge to John O'Groat's house, or eight hundred miles, which was accomplished in 14 days in 1873; an unparalleled ride, which throws into the shade the his-

tory of the most famous feats accomplished by horsemen. It is rather an amusement now for a trained bicyclist to watch for celebrated four-in-hands, and to run past them in triumph. If we are to believe the 'Graphic,' even the ladies have seen the value of the machine in the shape of the tricycle. A society is now in formation, and the ladies are especially invited to become members. There is no indelicacy, say the promoters, in a lady using one. One gentleman and his wife "did North Wales last summer, he taking the luggage and she the baby, and their pace was from eight to ten miles an hour." This looks like business, and we may say boldly that this toy of our boyhood has become a practical institution of our manhood; but it is still only a manly toy, conducive to produce athleticism, for we do not believe that either postmen or clergymen will use it for purposes of duty. The legs of most men are not up to the propelling power needed, and until a small engine is invented to do the work of the feet, it will remain a capital aid to exercise, like football, cricket, and the scores of toys of the young men of the present day; and long we trust it will remain a toy. We cannot have too many of them; for, with the mental strain put upon our young men, the only counterpoise to keep them in health is pure athleticism. We are glad to see that even the ladies have seen the value of toys to correct their sedentary habits. A vigorous game of

croquet brings the roses into the cheeks, and is a capital medicine to correct those nervous tendencies which are the failings of feminine indoor life. Why should they not also play cricket! We never could see the reason against it. The bloomer costume would obviate all the practical difficulties of long petticoats; and what a saving in cosmetics would be the happy result! With this advice we will close this chapter on toys. If it were adopted we have no doubt that it would be conducive to the creation of that last and most important toy that a young lady is always looking after and seeking to obtain, that very manly toy—a gallant husband.

## METROPOLITAN IMPROVEMENTS,

### ARTISTIC AND STRUCTURAL.

A FORTNIGHT on the Continent is not lost upon the Londoner, if he is of an observing turn of mind, and has not yet hardened into a Briton of that type which sees nothing away from home worth copying. The first journey abroad opens his eyes to the fact, that there are other cities worth seeing as well as his own Metropolis; and he gradually finds out that, with all our wealth at home, we do not make as good use of it as some of our neighbours. After the light and pleasant cities he meets with in his foreign rambles, London strikes him as being monstrously dull, grimy, and monotonous; and if he begins to examine the reason why, he cannot help coming to the conclusion that the Briton, with all his money, is in some respects a very stupid animal. At all events, he is

terribly dull in all that pertains to urban ornament; and he cannot help concluding that very many metropolitan sights he once thought were very great lions, are in fact, compared with those of other cities, but very little puppy-dogs. London may be the biggest city in Europe, but most certainly it is the ugliest. In most other great capitals, there is an organised structure visible; it has a backbone, limbs, and a head; but London is nothing more than a vast agglomeration of houses, thrown together by chance, with thoroughfares meandering about without rhyme or reason, like the paths on a village-green. We owe this want of plan undoubtedly to our parochial system, which has cut the town up into districts often having interests totally opposed to each other; and we have but very lately found out that a great city can no longer be managed in this fashion, and have appointed a sort of central government, in the shape of the Board of Works.

This Board has not been established too soon. If we look at the map of London, and endeavour to discover the anatomy of its thoroughfares, we are at once struck with the utter jumble it presents. Two or three streets run irregularly east and west, but not one single street places the north and south in anything like direct communication with each other. Petty thoroughfares, crossing each other at every conceivable angle, permeate the whole mass, and

cause a loss of time to its inhabitants which must amount to hundreds of thousands in the course of the year. All this confusion is caused by every man having a right to do what he likes with his own, without regard to the general welfare of the community. All this irregular action it will take years to correct, even if the central power is used mercilessly. Our purpose, however, in this paper is not so much to point out the developmental errors of our civic construction as to call attention to the fact, that in the new Board, devised to correct them, there is no power to deal with what, for a better known term, we must call the æsthetic element.

As a rule Englishmen know nothing, and care nothing, for art, unless it be for the purpose of ostentatious display. Men of business like to boast that their dining-rooms are hung with pictures of masters who command the highest prices; but put them to decide on any matter of artistic detail, and they are completely at sea. There are, however, plenty of individuals among us as capable of giving an artistic judgment as can be found on the Continent, and it is a very great pity that the Metropolitan Board do not avail themselves of their aid when a question of art comes before them. Look, for instance, at our public statues. There is not one of modern date in London that can by the merest courtesy be called a work of art. The very feeble style which charac-

terises them all, the attempt at simplicity of drapery to hide feeble modelling, must no doubt be accredited to the pitiable condition of statuary art ; but beyond this we may justly complain of the want of judgment in the manner with which statues, and especially equestrian statues, are placed, with reference to the spectators. It must be obvious that a figure on horseback should be seen somewhat on a level, or at least but a little elevated above, the public eye. Yet, absurd as it may appear, no modern equestrian statue has been erected that has not been hoisted high over the heads of the passers-by. Without referring to the monstrous statue at Hyde Park, which, together with the arch it crowns, looks monstrously like a French time-piece for the land of Brobdignag, we may instance the smaller statue of the Duke in front of the Exchange, and the royal rider who bestrides his horse in Pall Mall like a circus man at Astley's. Wanting in fire, as both these works of art are, their weakness is made truly ludicrous by the error of placing them without any railing around their pedestals. The consequence is that the Briton, with his love to come to close quarters, looks up at the statues from directly underneath, and of course sees the whole design foreshortened, the effect being most ludicrous. There is no particular merit in any of the equestrian statues placed in the midst of our west-end squares ; but our forefathers took the precaution to

erect the square-railing at such a distance as to prevent the effect of any such disastrous foreshortening.

It is a very moot question whether statues should be placed in any crowded places at all. On the one hand, it may be urged that if they are intended as memorials, they should be placed where they may be the reminders to the greatest number. But it does not follow because we pass an object that we see it. Possibly more people pass in front of the Royal Exchange than in any open place in the world. Yet we very much question if, among the daily flood of people, one per cent. notice the statue of the duke. A certain attitude of mind and freedom from surrounding bustle is necessary to the due appreciation of a work of art. Possibly, for this reason, some of the later monuments to eminent men have been erected in secluded places. The latest of these is that to Franklin, on the border of the garden of the Athenæum, and in the view of persons passing towards the Duke of York's column. There are some points about this statue which strike us as indicative of poverty of "*public thought*," if we may so speak. The daring adventurer for the sake of solving a great geographical riddle, should surely have deserved a memorial with loftier inscriptions than we find upon its base. Bassi-relievi are, without doubt, a great advantage as a means of telling the story of a statue; but certainly there is

nothing in a funeral, in which the mourners are dressed in bear-skins, which may be considered illustrative of the great problem to the solution of which the arctic navigator fell a martyr. To our mind, in a national scientific monument of this nature, it was not in the best taste to inscribe only the names of the *officers* who perished. Every man, down to the cabin-boy, deserved well of his country; and the omission of the other names brands the statue with that invidious mark which evinces, in our mind, the narrow spirit in which it was erected. The monolith to Speke in Kensington Gardens offends less against good taste; but did the discoverer of one of the sources of Old Nile deserve no noble words for the secrets he has ransacked?

Without doubt, Trafalgar Square combines the greatest number of advantages for the sites of statues of our great men to be found in the metropolis. There is space in plenty there; yet, for some unknown reason, the "First Commissioner," who claims the allegiance of the public statues, has removed from this site the noblest statue it possessed. Why Jenner, who deserved well of mankind, should have been removed from this noble site to the damp corner of the Long Water where "worried" nursery-maids alone see it, we do not know. Trafalgar Square may be made a perfect open air Valhalla, if properly managed; but it surely is absurd to place the open

space under the care of the Board of Works, and the statuary under the Woods and Forests. What unity of design can possibly result from this conflict between two such touchy Boards as these? If the space is to be given up to military and naval heroes, well and good; but it certainly is a great slight to the benefactor of humanity to move him from pillar to post at the mere whim of a chief commissioner. Sir Robert Peel said with truth that Trafalgar Square was the finest site in Europe, and we cannot help thinking what the Emperor Napoleon would have made of it if it were situated in Paris. Why, we ask, should its dreary waste of asphalte remain undecorated by trees? Acacias in boxes, and orange-trees, enliven similar open places in Paris, and why not here? Imagine, good reader, how bright it could be made by the judicious combination of marble statues and bright verdure, and by the introduction of fountains, so constructed as not to play upon you with all the force of a fire-engine in windy weather.

We certainly do not understand the value of open spaces in the metropolis. With squares in the midst of the most densely inhabited parts of London, with a population asphyxiated for want of air, with crowds of little children, ashen pale for want of light, we lock up in the most selfish manner immense reservoirs of oxygen; we hedge round with iron railings gardens blooming with trees and flowers, in a dog-in-the-

manger spirit that strikes the foreigner with astonishment. Lincoln's Inn Fields covers four acres, and all the boast we can make about it is that it is exactly the size of the base of the Great Pyramid. Close at hand is the dismal district of Clare Market and Drury Lane, where children die like flies in autumn, for want of such a space. Are there no means of bringing the want and the thing wanted together? This is no sentimental question, but one which touches the life of the citizen; for what occurs in Lincoln's Inn Fields and other metropolitan squares occurs in every large city in the three kingdoms. We saw, with regret, that the Horticultural Gardens would no longer be opened freely to the public on Wednesdays as hitherto, and the reason assigned for this withdrawal of a great favour is, we fear, at the bottom of the reluctance to open to the public the enclosures of the squares. It is asserted that boys at the destructive age took advantage of the liberty to turn it to license. Under present arrangements probably this argument is valid; but if these spaces were always open, there would be no rush, and, with a little care on the part of the police, no destruction. Open spaces that, formerly, were the scenes of riot and confusion, are now no longer so, since they have become planted and placed under guardianship. Kennington Common, for instance, and Paddington Green, once eye-sores to the surrounding inhabitants,

are now blooming parterres, in which the whole neighbourhood takes delight. There is a society which holds annual exhibitions, and distributes prizes for plants grown in areas and on window-sills. This is an amiable and good movement; but whilst we brighten our dull basements, let us not forget that there are scores of acres of pleasure-ground scattered about London, which are blooming deserts, where the foot of man or woman is heard but at rare intervals.

Leicester Square, which has long been the scandal of the town, is now, we are glad to see, turned to some good account. What a splendid site for a flower market—a light glass structure, the centre of attraction for fair women, who, like so many bees, would certainly be attracted by such a floral temple.

The greatest metropolitan improvement which has taken place within the present generation, is undoubtedly the introduction of landscape gardening and the method of flower embellishment in our parks. Of old it was thought that grass and trees were sufficient; indeed, the park was the idea on which these open spaces were planned. But as our population has increased, the parks have gradually been transmuted into pleasure-gardens. In the month of June the long walk in Regent's Park, and the walks on the east side of Hyde Park, cannot be matched for brilliancy of colour and tropical foliage by the Kew Gardens, or

some of the great pleasure-grounds of the nobility. But the Woods and Forests have not been contented with this improvement, and now the variation of the ground is the improvement aimed at. The park near Hyde Park Corner has in this respect been entirely transformed. The level grass rises into hillocks and pleasant undulating swards, crowned with noble shrubs. All the old rubbish of the town rapidly undergoing demolition, is used to build up an agreeable variety not only in Hyde Park, but in St. James's and Regent's Parks. If the plebs are denied the Horticultural Gardens, they are free of quite as delightful places of recreation ; and being quite free of them, we see that no damage is the result.

Next to the parks we are bound to admit that the improvements now being carried out by the Metropolitan Board of Works are the most important. The Thames Embankment may be likened to the vertebral column, or back-bone, of the new structural development which London is assuming under the guidance and superintendence of the Metropolitan Board of Works. Its beauty is beginning to appear, but it will be years before the true beauty of this great thoroughfare will declare itself. The row of trees sheltering the walk near the river-wall are beginning to put on vigorous foliage, and when the river once more flows clear of sewage, we shall be able to appreciate the beauty of the improvement.

The Thames is one of the noblest navigable rivers in Europe, but strange to say, until very lately, no person within the metropolitan limits ever set foot upon its banks. Indeed, it was only from the bridges that we could perceive that it had banks at all, and those were strewn with dead dogs and cats, and all the refuse of a great population. The embankment on either side of the river will open up a splendid boulevard, swept clear from end to end by the fresh breeze following the rivers's flow. The sanitary value of this new channel of oxygen running through the heart of the metropolis is incalculable. It is a great pity that the public embankment is not carried past Westminster Bridge, as only a short space intervenes before we find the roadway again running beside the river as far as Chelsea College; beyond this, again, we have Cheyne Walk, and a little labour would be sufficient to connect the Hammersmith and Chiswick malls into one esplanade from east to west, which would be unmatched in Europe. On the opposite side of the water we believe it is contemplated to continue the embankment up as far as Battersea, with landing piers at the new park. The old river will look picturesque once more; and if our steamboat proprietors only possessed a touch of the picturesque, "Citizen No. 2" need no longer be the hideous thing it is, but as tasteful as a Venetian gondola. Possibly now that a little embellishment is

finding its way into the age, and modifying its utilitarian spirit, we need not despair of some change for the better in this respect. A steamer may be built after the manner of a Roman galley, and yet do her twelve miles an hour, and carry quite as many passengers as the grimy river-boat now does.

On the Surrey side of the water, the noble street running from Westminster Bridge to the Borough Road is another thoroughfare formed, or rather forming, under the same auspices, which promises to alter the whole character of this once dismal quarter of the town. Passing along the line of route for the first time, we were struck by its noble proportions and the beauty of many of the buildings already completed. It is observable, that in whatever part of London a house is pulled down, it is being replaced by a far loftier and handsomer structure. In the City some of the new buildings are of great beauty. We would especially refer to a noble Italian structure on the north side of the Bank, on which ornament is lavished with a hand as profuse as on any Florentine mansion of old.

The abundant use of coloured marble is a very remarkable architectural feature at the present time; such also is the complete abandonment of the classical style, or rather the so-called classical,—for, with the exception of some of the work of that true artist, Decimus Burton, there is not a classical building in

London with the slightest pretensions to purity or beauty, not even the British Museum or the new public offices in Downing Street.

This abandonment of the classical style is much to be praised. Without a clear pure atmosphere it never can retain that chastity on which so much of its beauty depends. Even a Roman building, such as St. Paul's, becomes a caricature when made party-coloured by the incrustation of soot, washed here and there by the action of the wind and weather,—like a chimney sweep who has given his face “a lick and a promise.” The corroding action of time, and even the impurity of the atmosphere, on the contrary, give in many instances an additional interest to Gothic lines, adding that appearance of antiquity which they seem to require. It is certainly odd to find even warehouses erected in the style of the Renaissance, and in the Lombardian manner; but they at least make our streets look picturesque, which is a feature they have not possessed for ages.

In every portion of the metropolis the houses are growing up to the sky; and it must be remembered they are replacing a London of the ugly periods of Charles and James II., when our domestic architecture was more hideous than it had ever been before, or is ever likely to be hereafter. In the Poultry and in Fleet Street we still see houses erected immediately after the great fire, many of them bearing the date

1668 upon their fronts. But there will be nothing to regret in the disappearance of this "London after the fire;" it neither possessed the poetry of antiquity nor the conveniences of our later domestic architecture. It will disappear without leaving any mark behind of its bad taste. The only thing to be regretted is, that the new London that is arising is built on the old lines of thoroughfare, and that the old lines followed those that existed before the great fire. This is much to be lamented; the traffic is enormously increased, and will go on increasing year by year. What chance the sunlight will have of finding admission when such narrow streets as the Poultry have doubled in height, as is the case with some of the new houses already, we scarcely dare surmise. This is a matter the Board of Works should look to, as it involves a sanitary question of very great importance. The neglect to widen the Poultry is certainly an error of the gravest kind: it is the principal entry into the City from the west, and although it is "turned" by the splendid thoroughfare constructed from the Mansion House to Blackfriars Bridge, in continuation of the Thames Embankment, still the Holborn traffic and all the flood of carriages tending northwest must still use it. As regards the traffic, this street certainly required throwing back some ten feet, much more than Ludgate Hill, provisions to widen which are being made.

It was promised that the railway bridge should be an

ornamental structure, and now we see what idea of ornament the Chatham and Dover Company have. The only approach to embellishment of any kind is the City arms, and we suppose the engineer of the company imagined that the City authorities would accept its introduction as an undoubted work of art. May we here be allowed to ask if the foot-bridge which has been erected on each side of the railroad is ever to be thrown open to the public? The crossing here is one of the most dangerous in the City, and the cross-traffic, even to those who brave danger, causes the most annoying delay. The whole structure is an eye-sore, hiding the fine view we once had up Ludgate Hill, with the dome of St. Paul's beyond.

We have often admired this chance street-view, the only one which takes in the metropolitan cathedral from base to summit; but as we now look from Fleet Street, say from the corner of Shoe Lane, towards the cathedral, one of those extraordinary specimens of ill-taste, of which the advertising mania offers so many specimens, is afforded us. Gigantic posters, twenty feet long, in red, white, and blue, of a family grocer, and of the London, Chatham, and Dover Railway, with letters a foot deep, are so placed at the side of the bridge that it cuts in half, as it were, the view of the splendid dome, producing an effect which is incongruous and ugly in the extreme. If there were an officer whose duty it was to prevent such infractions

of good taste as this, it certainly would be a great advantage. The dome could not look much more defaced if these gigantic posters were pasted directly upon it. We wonder the Corporation of London have not availed themselves of this commanding site as an advertising station. What would not a celebrated tea-dealer close at hand give for the right of imploring the whole metropolitan world from its ample cupola to "Remember No. 1!" The business of bill-sticking, as carried on in London, certainly should be put under some control. As it is, every vacant wall is taken possession of, every house abandoned to Chancery is seized upon, and made hideous by a mass of posters which would be sufficient to destroy the effect of the best architectural view.

## DOGS IN PUBLIC.

It is evident that much capital is to be made out of dogs, otherwise Mr. E. T. Smith would not have thought it worth his while to call together such a fine company of competitors for canine honours as he did on a late occasion. Twelve hundred animals, yelling, howling, and snarling, under the same roof! Our readers may imagine the chorus. And the company that collected to meet and do them honour, what a distinct section of the population! That man influences the dog, we had at the show a complete proof in the extraordinary instances of breeding evinced in the bulldogs and terriers; but it may be doubted if dogs do not influence man in nearly as marked a degree. Why should the company of dogs dictate to a man the kind of coat, and hat, and trousers he shall wear; the nature

of his necktie—nay, even the amount of the hirsute appendage he shall allow himself upon his chin, and the very expression of his face? That the canine race do dictate to man in these particulars, a glance at the style of the company present day by day at such shows is sufficient proof. What sympathy must there be between the two races to produce such mutual influences! We are not going to write an account of the Ashburnham Hall Dog-Show from a sporting point of view; for, in the first place, we are not of the fancy; and, in the second place, we don't believe in the fancy. Jemmy Shaw, for instance, thinks that it is the highest effort of human skill to breed a terrier down to the size of his "Little Wonder," or about four and a half pounds—"As beautiful as a racehorse, as hard as steel, and as courageous as a lion." This process of reduction may be very interesting to Mr. Darwin, but we very much question its utility, and we altogether deny and disdain the standard of beauty set up by the "fancy" in matters canine. When one comes to think of it, does it not stagger one's belief in the aspirations of mankind after the true and beautiful? Does not one doubt the truth of Keats' line,

"A thing of beauty is a joy for ever,"

when one sees our race of dogs reduced by extraordinary care to the utmost conceivable pitch of ugliness, and to find people—reputed to be knowing ones—

actually believing in that ugliness as the acme of perfection and beauty? Thank God, the utmost effort of the breeders's art cannot make anything but a noble gentleman out of the bloodhound. How judicially the few hounds of this class carried themselves! and how, with their deep-set eyes and solemn sad faces, they seemed to look down upon the crowd of bipeds collected to inspect them! We saw Mr. Boom's "Rufus" to wit, "taking stock" of two gentlemen dressed in tight trousers and Belcher handkerchiefs, and with hard, heavy jowls—just as the Chief Baron might have surveyed two felons in the dock.

The mastiff race we always understood had dropped out of the chain of animal life; but here they put in an appearance: though, we fear, not altogether a satisfactory one. There was evidently a good deal of the heavy Mount St. Bernard blood in many of them, and only two or three came up to our ideal of the old English mastiff—lithe, powerful, and long in the body, with something of the panther in their movements, and with a jaw firm and solid, but far less heavy than those possessed by the hippopotamus-breed shown as mastiffs. "Rover" and "Bran," selected by the judges, were near the mark, but not quite up to it. The Newfoundlands were, with scarcely an exception, mongrels. Indeed, any very big dog with a curly coat is believed to be a Newfoundland; and if his name is "Sailor," and if he will fetch a stick out of the water, that is

evidence enough to the public generally that he is a thorough-bred one. The Mount St. Bernards, again, were of all shapes and sizes.

As regards the sporting dogs, any one who knows the value of good animals of this class will not be surprised to find that the best in the country were not represented here. Indeed, dog-shows have not yet made such way among us as to entice the great sporting magnates to send their dogs, and only a second class of animals was to be expected.

The silver cup, value fifty guineas, and the second prize, value twenty-five guineas, were not competed for; the offer was not likely to tempt Badminton or Belvoir. Pointers were very well represented, and the prize dog, "Ranger," was really a noble animal as regards form. How he would work in the field is, however, quite a different matter. English setters were very badly represented, but the black and tan Irish dogs of this class were really beautiful animals. Retrievers were very plentiful; indeed every person who possessed an animal of this kind, apparently sent him for the mere vanity of saying he had competed, and possibly for the sake of obtaining a free entry. It is a great pity that some method of selection was not adopted, as dog-fanciers did not go to see 1200 indifferent dogs, and the public generally would have been better pleased with a third of the number. However much owners may be delighted, care must be

taken that the next show is something better than a collection of household pets. We could not help noticing, however, No. 378, a Russian retriever, with a very odd, long, wiry coat, very much like that of a Scotch deer-hound. Among the quaint dogs present there were some very clever-looking fox-terriers with uncut ears, just like those of bats: these and the beagles, and the Clumber spaniels attracted a great deal of attention. After these small dogs, and indeed after everything also in the show, the boar-hound, at the top of the large room, astonished the visitors. This powerful animal, with limbs like those of a lion, stood at least four feet high, and his fangs were something terrible to behold. This dog is of the true breed of boar-hounds which we see in those powerful pictures of Snyders and Rubens,—heroic animals, by the side of which our sporting-dogs are insignificant pets.

With the dogs in the large hall "the Fancy" proper were little interested; it was only on entering the smaller shed running parallel with it that this class of the *genus homo* showed itself. Each bull-dog and bull-terrier of eminence had its master present, who appeared to be a kind of inferior appendage to the animal itself. In the large room there were a few powerful bull-dogs which maintained the character of this class as an animal of physical power as well as of surpassing pluck; but in the little room they grew "small

by degrees and beautifully less," until some of them appeared to be but a four-legged kind of tadpole, all head and jaw. The bull-terriers were equally small, but as a rule, finely bred, and of a high class. The London breeders have brought this dog to the highest perfection, and we may say the same of the black and tan terriers, of which there was really a splendid show. The changing fashion in pet dogs is one of the notable things of the time. A dozen years ago no lady was complete without her Blenheim or King Charles spaniel. There were plenty of these breeds present, but as a fashion they are decidedly on the wane, and the Maltese and the pug are now in favour among the *haut-ton*, whilst Dandy Dinmonts and Skyes find congenial homes among the upper middle-classes. Some of the Maltese were too ethereal to be handled, and were fenced off from the rough public by glass cases. One large case contained a pure white Maltese, with his black hair parted with a perfection that could not be matched by Lord Dundreary. The Skye terriers were, on the whole, below par, but the pugs must be considered fine, as they were so very ugly. The little five-pound terriers and the Italian greyhounds shivered continually, and watered at the eyes, as all of these little high-bred, thin-skinned, over-nerved animals do; but the ladies much admired them, and therefore we must not be hard upon them, we suppose. We have heard of blue boars and blue lions, but we confess we

were puzzled at the heading "Blue Scotch Terriers" in the catalogue. The black has certainly a shade of blue in it, like that on a raven's wing, and there is a reddish tinge, which gives the dog a very odd appearance. The real curiosities of the Exhibition, however, were found among the foreign dogs. It brought to mind at once the pictures in Arctic voyages and travels to look at some of the little Esquimaux dogs—fat, short little fellows, with fox-like heads, and bushy tails curled tight over their backs. "Etah," a very large dog of this class, suggested a sad tale, as he is the only survivor of a pack used by Dr. Kane in his search after Sir John Franklin.

We can readily understand a dozen of such fine fellows as this, doing weeks of heavy sledging-work, but the physical powers of the smaller Esquimaux dogs seem scarcely up to such heavy work, unless employed in large numbers. Possibly this Exhibition introduced first to the British public a dog we are all familiar with in books of travel, but whom very few of us have seen—a thorough-bred Australian dog, or dingy. A nearer likeness to a wolf we never saw, and his appearance certainly suggests that he is the missing link between the dog and that animal. There was a truffle-hunter to be found in this odd corner—a queer little fellow apparently of no particular breed. The wolf-hounds shown here seemed but light animals to tackle such an enemy; but we are told that the sire of the specimen

exhibited by Mr. Frank Buckland is known to have killed several hyænas and wolves in the neighbourhood of Constantinople. A common hound to be found in Turkey and Asia Minor—the scavenger of the country, in fact—was also exhibited here, and attracted a good deal of attention. It seems to us that dogs abroad are pretty much in a state of nature, if we except the French poodle, who does such credit to the canine peruquiers of that country : and with this state of nature they seemed to have retained a degree of vigour which our breeders are sacrificing, to produce certain qualities which are not compatible with the general health and energy of the animal, and consequently, with his powers of reproduction—a matter which dog-fanciers may not care about, but which, if true, proves that we are working upon a wrong system, which, sooner or later, will correct itself.

## HALLUCINATIONS AND DREAMS.

THE hallucinations of all ages and countries have been marked by one invariable fact; they have referred to some particular train of thought or religious sentiment that impressed the public mind, and the age in which such visions have been seen. Thus, in the old Roman time, the apparitions witnessed, or supposed to have been witnessed, referred to the pagan deities, the fairies and satyrs, and other ideal beings, by which the ancients personified nature in her different attributes. In the Christian era, the visions referred to the Almighty, Christ, or the Devil, or those sacred personages that were made the subject of their daily thoughts. The Arabians, again, had visions of genii and gins, and the different nationalities kept to those reflections, if we may so speak, of the current ideas of the day. The Christian never saw Bramah, and the

Brahmin never was allowed to witness the apparition of Christ or the Virgin Mary ; neither did the Catholic ever see genii or a satyr. They saw only those personages who were in their daily thoughts, or who were associated with the deepest emotions of their nature. This is, we think, the proof that each vision proceeded from the minds of the spectators, instead of having been really seen from without. Dr. Boirre de Boismont, in his work on 'Hallucinations,' has collected a vast number of cases illustrative of this position, and of the various mental conditions under which persons have seen visions and spectres. It is said of the great Talma that it lay within his power to transform his brilliantly dressed audience into so many skeletons. Dr. Wigan says, that an artist, who succeeded to a large portion of the practice of Sir Joshua Reynolds, turned the faculty of seeing his sitters after they had left to great pecuniary advantage. He was in the habit of taking only half an hour's sitting, during which time he studied the individual minutely, and in this way so impressed his features upon his memory that he never required his presence again. When he wished to proceed with the portrait again, he called up the sitter and placed him in a chair, and so finished the portrait in a very short time. Several sitters were at the same time stored up in his memory, and were so called up at his will. This extraordinary power was, however, a symptom of coming disease ;

for after he had taken advantage of it for several years, during which time he never painted less than three hundred portraits a year, his faculty began to fail him, his imaginary sitters began to dispute respecting the real sitters to which they belonged; he became confused, and ultimately insane. He described his power of seeing the sitter after he was gone as more vivid than the real life; but all these exaltations of the senses are premonitory of disease. Dr Wigan gives us the experience of another patient, who had the power of placing himself before his own eyes. This double laughed when he laughed, and even argued with him. Thus, haunted by himself, at last it grew beyond a joke; he became miserable, and resolved to terminate his existence. He did this with great deliberation; for he waited until the end of the year, when, upon the night of the 31st of December, having made up all his accounts, he shot himself. Now, although in neither of these cases was there any insanity in the outset of these singular examples of hallucination, yet the termination of them clearly proved that the minds of these individuals were not in a healthy state; they were, in fact, suffering from the incipient stage of brain disease, which is wholly undiscoverable to friends and casual acquaintances.

Hallucinations involving insanity are often described by those experiencing them in a manner so circumstantial that, were it not for the absurdity of their

statements, it would be difficult to doubt that they were made truthfully and in good faith, and had really foundation in fact.

Dr. Prichard gives an example from the mouth of a patient, which is so life-like that it seems a pity to omit one word of it. He said:—"One afternoon, in the month of May, feeling himself a little unsettled, and not inclined to business, he thought he would take a walk into the City to amuse his mind; and having strolled into St. Paul's Churchyard, he stopped at the shop window of Carrington and Bowles, and looked at the pictures, among which was one of the Cathedral. Here he met with an elderly gentleman, dressed in dark brown clothes, who entered into conversation with him and persuaded him to dine with him, and afterwards to ascend the ball of St Paul's, just below the cross.

"They had not been there many minutes when, while he was gazing on the extensive prospect and delighted with the splendid view below them, the grave old gentleman pulled out from an inside coat-pocket something like a compass, having round the edges some curious figures; then, having muttered some unintelligible words, he placed it in the centre of the ball. He felt a great trembling, and a sort of horror came over him, which was increased by his companion asking him if he should like to see any friend at a distance, and to know what he was at that time

doing ; for if so, the friend of the latter should show him any such person. It happened that his father had been for a long time in bad health, and for some weeks past he had not visited him. A sudden thought came into his mind, so powerful that it overcame his terror, that he should like to see his father. He had no sooner expressed the wish, than the exact person of his father was immediately presented to his sight in the mirror, reclining in his arm-chair and taking his afternoon sleep. Not having fully believed in the power of the stranger to make good his offer, he became overwhelmed with terror at the clearness and truth of the vision presented to him, and entreated his mysterious companion that they might immediately descend, as he felt himself very ill. The request was complied with, and, on parting under the portico of the northern entrance, the stranger said to him, 'Remember, you are the slave of the Man of the Mirror.'

"I inquired in what way the power was exercised? He cast on me a look of suspicion mingled with confidence, took my arm, and, after leading me through two or three rooms and then into the garden, exclaimed, 'It is of no use; there is no concealment from him, for all places are alike open to him. He sees us and hears us now.' I asked him where the man was that heard us? He replied, in a voice of deep agitation, 'Have I not told you that he lives in

the ball below the cross on the top of St. Paul's, and that he only comes down to take a walk in the churchyard, and get his dinner in the house in the dark alley.' He also spoke of the tyranny he exercised over all those within the circle of his hieroglyphics. I asked him what these hieroglyphics were, and how he perceived them? He replied, ' Signs and symbols, which you, in your ignorance of their true meaning, have taken for letters and words, and reading, as you have thought, "*Day and Martin and Warren's Blacking!*" Oh, that is all nonsense! They are only the mysterious characters which he traces to mark the boundary of his dominions, and by which he prevents all escape from his tyrannous power. How have I toiled and laboured to get beyond the limits of his influence! Once I walked for three days and nights, until I fell down under a wall exhausted by fatigue and want of sleep; but awaking, I saw the dreadful signs before my eyes, and I felt myself as completely under his infernal spells at the end as at the beginning of my journey.' "

This is the complete hallucination of a lunatic; a story of the most circumstantial nature is connected, which is yet of the most absurd nature, having no reference to the daily habits of the person who believes he has been subject to it. In some individuals the visions that appear are of the most simple kind, being generally confined to one person or thing, the imagi-

native faculty being entirely wanting in them. In the hallucinations that occur in those suffering from *delirium tremens*, as a rule, the visions are in the form of animals running about the room, or over the bed, making grimaces; sometimes they appear in extraordinary numbers, but so small that a host will appear upon a sheet of paper. Persons will appear to follow patients affected in this way, who immediately disappear when any attempt is made to clutch them. Any chance object seem to give rise to hallucinations in this disease. The person suffering from these delusions may be perfectly rational on every other matter. He may converse with calmness, and very rationally, but in the midst of his conversation, some portion of the dress of the person with whom he has been conversing, suddenly takes the form of some creeping thing, or of a grinning devil, who flies away with horror. These hallucinations are of a very fleeting character—a fresh potation will often banish for the time the phantoms that appear to surround him.

The effects of opium-eating give rise to the same kind of hallucinations. The visions that are called up by the excessive use of this drug are of a more pleasurable kind. Indeed, De Quincy in his ‘Confessions of an Opium Eater,’ has given us a picture of the delights experienced by indulging in this narcotic, which would be tempting enough to some minds, did not the miserable condition of the patient in his

waking state serve as a horrible warning. Dr. Porqueville in his 'Voyage en Morée,' gives a description of a case related to an English ambassador by an Indian king. This high personage having been led to a sumptuous apartment, in a short time two servants bearing a litter, approached. Upon the litter, covered with a shawl of great value, a human form was borne, to all appearance dead. Presently, however, an officer in attendance produced a bottle in which a bluish-looking liquor appeared. The ambassador, thinking he was the involuntary witness of some funeral ceremony, wished to retire; but he was undeceived upon observing one of the officers raise the head of this apparently lifeless being, replace the tongue, which was hanging from the mouth, and make it swallow some black liquid, at the same time closing the mouth, and gently rubbing the throat in order to facilitate its passage. When this operation had been repeated five or six times, the figure opened its eyes, and closed its mouth of its own accord; it then swallowed without assistance another large dose of the liquid, and in less than an hour became revived, and sat up upon the couch, having somewhat recovered its natural colour and the partial use of its limbs. He then addressed the envoy in person, and asked him the object of his mission. For nearly two hours this extraordinary being remained perfectly conscious and capable of transacting business of the greatest importance. The

English ambassador took the liberty of asking him some questions concerning the strange scene he had witnessed. "Sir," he replied, "I have long been an opium-eater, and by degrees have fallen into this deplorable condition. I pass three parts of the day in the torpid condition in which you have seen me. Although incapable of moving or speaking, I retain my consciousness, and during this time I am surrounded with the most delightful visions ; but I should never awake if I were not surrounded by zealous and affectionate attendants, who watch over me with the most anxious solicitude."

The use of hascheesch in the East produces the most delightful visions. It is a preparation of Indian hemp, a very powerful narcotic, and one which is coming into use in this country. The fact, that by the use of drugs we can artificially produce hallucinations for a very short period, such as are persistent in the really insane, is very curious, and proves that in the latter case there is an exaltation of the brain, the product of a morbid condition, produced probably by the blood. It must be confessed, however, that the visions and delusions produced by the use of drugs are different in kind to the true hallucinations of the insane. The mind sees with the inner eye as it were, and the figures or visions partake more of the nature of those which appear in a dream. When the person under them has recovered from their effects, he is conscious that what he has

seen was the product of his own excited brain. No doubt, however, when the habit of taking any drug, which acts in this manner upon the brain, is persisted in, the visions appear to move in the outward world, just as they do in *delirium tremens*, which is produced by the action of spirits. In all such cases of brain excitement, the senses for the time are preternaturally acute, the hearing and the sight are marvellously exalted, and the memory for past events and scenes is very vivid.

The scenes that pass before the mind in sleep may be likened to those produced by narcotism. Whilst they are passing like a panorama, they seem to be veritable objects, and we believe in them most implicitly. The most extraordinary events occur without in the least appearing strange to us,—indeed, the senses of surprise and comparison seem for the time suspended ; judgment is also wanting ; in short, we seem to be quite as satisfied of the naturalness and truth of the most extraordinary and contradictory scenes and actions, as do the insane with respect to their own ideas. Indeed, the waking dreams of the demented are in many respects the counterparts of those which we experience in our healthy slumbers ; the only difference is that the sane do not act upon them. But in the case of the somnambulist, there is not even this point of difference. Persons in this condition are continually walking in their sleep—generally without

harm to themselves, but sometimes they walk through open windows and are killed. A case is told of a monk in a religious house in Germany, who used to walk about the monastery at night in one of these fits. On one occasion he knocked at the Friar's door, who not happening to be in bed, let him in. He immediately made his way to the bed, and with a knife which he had, stabbed the clothes through to the mattress, and then returned to his own cell. The next day upon the friar inquiring of him what was passing in his mind when he performed this terrifying act, the monk, much disturbed, replied, "My father, I had so strange a dream that I am most reluctant to tell it to you. It was, perhaps, the work of the devil, and—" "I command you," said the Friar. "My father," he then said, "scarcely had I gone to bed, when I dreamed that you had killed my mother, that her bleeding phantom appeared to me and demanded vengeance. At this spectacle I felt in such a transport of fury that I ran like a madman to your apartment, and having found you I stabbed you. After that I awoke in a profuse perspiration, horrified at my attempt, and I returned thanks to God that I was free from so great a crime." "You were nearer committing it than you imagine," said the Friar, and very discreetly ordered that in future he should be locked in his cell for the night. This unconsciously acted drama has no doubt often been repeated with a more tragic

termination in other times, and possibly many a man has suffered the punishment of death, for a homicide perpetrated entirely in a state of unconsciousness. It is a remarkable characteristic of the state of dreaming, that the mind often assimilates in the train of ideas it is pursuing, any chance sound that may strike upon the ear. The slamming of the door, for instance, is changed into the discharge of a gun, and the current is no doubt often changed by these interruptions. Thus, it is obvious that the brain has a certain power of directing its action even when we are totally unconscious. The bodily movements again, which take place in sleep, set the mind upon a new course of adventure; the excitement which takes place in the different organs, suddenly colour the misty action of the dream, and no doubt the extraneous sights and sounds are accountable for many of the sudden distractions which we all experience in the visions we have in the night. Many persons who sleep in snatches have the power of continuing the thread of their dream after it has been broken by the waking state. We have this power ourselves, and we feel that by a constant practice, the habit would become so persistent, that it may be transmitted into an act of will, as in the mind's action in the day time.

In the act of dreaming many persons talk, holding imaginary conversations with individuals. Maniacs very often unconsciously give a clue to the cause of

their afflictions in this manner ; secrets that they have kept close during the day with the reticent cunning of their class, thus leak out in the silence of the night. Esquirol utilised this fact in his asylum, by passing the night near the beds of patients whose history was unknown to him, and in this manner possessed himself of a key to their malady. That ideas occur to us in sleep which we are not capable of in our waking state, the experience of every one proves. It is acknowledged that there is such a thing as unconscious cerebration ; in other words, when we have cudgelled our brains in vain, over some mental work, and are compelled to give it up in disgust, it often occurs that on recurring to the subject next morning, our ideas flow from our pen smoothly and swimmingly. This fact will account for the remarkable tales we hear of mental difficulties solved during sleep. It is related of Tartini, the famous composer, that after wearying himself in vainly attempting to finish a sonata, he fell asleep, and dreamed of the theme that was in his mind. In this dream the devil appeared to him and proposed to help him in his sonata, provided he would give him his soul in return. He agreed, and the devil at once composed the sonata off-hand, in the most charming manner. When he awoke he rushed to his desk and put down the notes which still lingered in his memory, and the result was the masterly sonata which is now known as the ' Sonata du Diable.'

The absence of volition, which as a rule characterizes the state of dreaming, marks the difference between it and insanity, otherwise the two conditions are wonderfully alike. This was appreciated by the ancients. Cicero says that if it had been ordered by nature that we should actually do in sleep all we dream of doing, every man would have to be bound down before going to bed. "Half our days we pass in the shadow of the earth, and the brother of death extracteth a third part of our lives," says Sir Thomas Browne.

Some of the hallucinations of the early and middle ages were of the most remarkable kind, and prove that the transmigration of the human body into animals was a popular belief, and was, as far as possible, actually put in practice. Thus Lycanthropy possessed large numbers of people in France and Germany in the fourteenth and fifteenth centuries. Persons suffering from this form of hallucination imagined that they had married female wolves. They actually left their homes and went into the forests, where they let their hair and nails grow, and became for the time wild beasts. They were known popularly as were-wolves, and it was supposed that they were thus transformed by witchcraft. Persons so possessed became furious beyond the most savage animals; they mutilated and even devoured children. At the trial which took place in 1521, at Besançon, three of these were-wolves confessed that they had

given themselves over to the devil. One of these poor creatures said that he had killed a boy with his teeth and claws, and would have eaten him but for fear of the country people; another admitted that he had killed a young girl as she was gathering peas in a garden; another confessed that he had not only killed but eaten four others. These poor creatures were evidently insane; but the science of mind in those days could not be expected to have realised this fact, when we find that even now the law slays when it should put the homicide in an asylum. These three madmen were accordingly burned alive, the fate of all such demented beings who were afflicted with the like delusion in those days. The middle ages, possessed with a belief in the apparitions of angels and saints and devils, were necessarily imaginative ages, and immensely dramatic in their poetic forms. We have not room to afford instances of the countless apparitions which were called forth by the religious spirit of the times. A vast number of these visions or apparitions seen by the hallucinated had no bearing with reference to the movements of the period; most of the warnings they gave were never fulfilled, and were forgotten, but the few which really made a hit were remembered, and handed down from father to son by the cunning spirit of priestcraft,—just as in the present day all the minor hits of Zadkiel, in his Almanack, are duly trumpeted forth in

the next year's issue, whilst the unfulfilled prophecies, like those of Dr. Cumming, are quietly ignored, or adjourned for the benefit of some succeeding generation.

But the power to see visions and to receive spiritual communications from angels is far from having yet departed from among us. The upper classes have, it is true, left off these old romances of the past, but they have taken to other forms of "spiritualism," as we shall presently show. The lower classes still believe in the old story, and repeat with increasing repetition the old delusions inculcated in the middle ages by the priesthood. As the latest instance in which the lower middle class have shown a revival of the old spiritual form of hallucination, may be mentioned the "Shakers," a company of whom have lately been imported from the United States. It seems strange that in the New World, where it would be supposed old ideas would have failed to make a footing, this society should not only exist, but should number their thousands. It may be that the power of imagination was the principal agent in enabling Macdonald, a disciple of Robert Owen, to induce a body of emigrants, many years ago, to go over to that country and to establish a community, living in common after the ideas of their master,—a community who can be brought to believe that such a system is possible, even in America, may easily be imagined to be open to accept any form of spiritual delusion.

The Shakers, it appears, were founded by a factory girl, born in the latter part of the last century, in Manchester. Her name was Anne Lee. She was believed to be an incarnation of the Almighty and the mystical Bride of the Lamb, referred to in the Revelations. She took to preaching in the streets, caused an obstruction, was locked up in the Bridewell, and during the night she affirmed that the Lord appeared to her and was spiritually united to her. When she was released, a number of followers surrounded her, and an angel directed them to depart with her to the land of promise, America. They took up their abode in the settlement of Water Violet, in the State of New York. This girl they held as their director, and termed her Mother Anne. After ruling them about eight years, she died; and her disciples profess to hear from her constantly from her heavenly abode. These disciples are strictly celibates, and, strange to say, no scandal has ever been reported respecting them. We know what has been reported of the monks of old; and we can only account for this exemption from like reports by supposing that the religious fervour of the new people held them above a physical weakness, which is certain in any societies to appear as soon as familiarity overrides the strong original inspiration which first induced them to exclude themselves from the world.

As an example of the curious mental condition of

these people, we may quote from Mr. Macdonald the peculiar nature of their service, as witnessed by himself.

“At half-past seven P.M., on the dancing days, all the members retired to their separate rooms, where they sat in solemn silence, just gazing at the stove, until the silver tones of a small tea-bell gave signal for them to assemble in the large hall. Thither they proceeded in perfect order and solemn silence. Each had on their dancing-shoes, and on entering the hall they walked on tip-toe and took up their positions as follows:—The Brothers formed a rank on the right, and the Sisters on the left, facing each other, about five feet apart. After all were in their proper places, the chief elder stepped into the centre of the space and gave an exhortation for about five minutes, concluding with an invitation to them all to go forth,—old men, young men, and maidens—to worship with all their might in the dance. Accordingly, they ‘went forth,’ the men stripping off their coats and remaining in their shirt-sleeves. First, they formed a procession, and marched round the room at double-quick time, while four Brothers and Sisters stood in the centre singing to them. After marching in this manner until they got a little warm, they commenced dancing, and continued until they were all pretty well tired. During the dance the Sisters kept on one side and the Brothers on the other, and not a word was

spoken by any of them. After they appeared to have had enough of this exercise, the elder gave the signal to stop, when immediately each one took his or her place in an oblong circle formed around the room, and all waited to see if any one had received a 'gift,'—that is, an inspiration to do something odd. Then two Sisters would commence whirling round like a top, with their eyes shut, and continued their motion for about fifteen minutes, when they suddenly stopped and resumed their places, as steadily as if they had never stirred. During the whirl, the members stood round like statues, looking on in solemn silence.

"This whirling process is supposed to screw out of the Mother the message she desires to give to her votaries; and on this occasion the dead Mother Anne was reported by the whirlers to have communicated to them that she had sent two angels to inform them that a tribe of Indians had been around them for a couple of days, and wanted the Brothers and Sisters to take them in. They were outside the building, looking in at the windows.

"I shall never forget (says Macdonald) how I looked round the windows expecting to see the yellow faces when this announcement was made; but I believe some of the old folk bit their lips and smiled. It caused no alarm to the rest; but the first elder exhorted his brethren to take in the poor spirits and assist them to get salvation. He afterwards repeated

more of what the angels had said,—viz., that the Indians were a savage tribe who had all died before Columbus discovered America, and had been wandering ever since. Mother Anne wanted them to be received into the meeting to-morrow night.

“Accordingly, the next evening, after the dancing was over, the Sisters originally intrusted with the message, after the doors and windows of the hall were opened, said that she saw strangers mingling with the Brothers and Sisters. The chief elder exhorted them that they should take the strangers in.

“Whereupon (says Macdonald) eight or nine of the Sisters became possessed of the spirit of the Indian ‘squaws,’ and about six of the brethren became Indians. Then ensued a regular ‘pow wow,’ with whooping and yelling, and strange antics, such as would require a Dickens to relate. The Sisters and Brothers squatted down on the floor together, Indian fashion, and the elders and elderesses endeavoured to keep them asunder, telling the men they must be separated from the squaws, and otherwise instructing them in the rules of Shakerism. Some of the Indians then wanted some ‘succotash,’ which was soon brought them from the kitchen in wooden dishes, and placed on the floor, when they commenced eating with their fingers. These performances continued till about ten o’clock; then the chief elder asked the Indians to go away, telling them they should find some one waiting

to conduct them to the Shakers in the heavenly world. At this announcement the possessed men and women became themselves again, and all retired to rest."

It is needless to proceed further with this miserable farce; but it is evidence that there is no folly which those possessed with a religious craze cannot be induced to enact. As we have seen, a sect of these Shakers were until lately settled in the New Forest, where a Mother Girling is the leader; and their fanaticism has induced them to suffer severe hardships in the belief that the Lord has sent them for their good. However benighted these poor people may be, there is something really grand in their behaviour, self-denying as it is, compared with the miserable delusions educated members of the upper classes profess to believe in, in the shape of mesmeric influences, table-turning, and spirit-rapping. There can be no possible excuse for such people; and when we consider the attempt that was made to declare Mother Girling insane, we ask ourselves how much more open the drivelling idiots who participate in such miserable delusions are to the charge, than these poor uneducated fanatics, who at least practice the virtue of self-denial.

## THE MASSACRE OF THE INNOCENTS.

WHEN a murder is committed, and the murderer for a time escapes the pursuit of justice, but is supposed to be still hidden amongst us, the agitation of the public mind is very remarkable, and the desire to cast him out gives rise to all kinds of unfounded reports and accusations and a great waste of police activity. Possibly, if we could lift the veil and really see the amount of murder that is going on day by day undiscovered, our feeling of horror would become somewhat blunted. If the metropolis was profoundly agitated by the fact that Mr. Briggs's assassin was at large, roaming its intricate wilderness, what shall we say to the mine the late Dr. Lankester has sprung in our midst by his statement gathered from professional experience as Coroner for the Central Middlesex district, that there are now living amongst us in the metropolis, *twelve*

*thousand women* who have murdered their infants ! This remarkable statement, in his second annual report, and the dictum on which it is founded, is the fact that there are annually one hundred and fifty children murdered and abandoned in the highways and byways, in the pools, canals, and rivers within the metropolitan district. Dr. Lankester assumed that where one murdered little one is brought to light, another is successfully hidden for ever; and this estimate we should think rather under than over the mark. This brings the grim total up to three hundred children whose mothers have put them foully to death each year. The experience of his office led him to average the age of the mothers who commit these infanticides at twenty years, and as the expectancy of life at that period is forty years, we have only to multiply three hundred by forty to give the total of this ghastly sum—twelve thousand murderesses living in our midst, performing our domestic offices, ministering to our private wants, and doing women's work about in the town, with their dreadful secrets locked up in their breasts ! To balance this possible over-estimate, we have the probability that the woman who has murdered one child may have murdered another. We know that Dr. Lankester mercifully shut his eyes to this suspicion, but we fear that it is only too likely to be the case, knowing that in crime the French saying, "*Ce n'est que le premier pas qui coûte,*" is only too applicable.

And it should be remembered that every year this estimate of the population of murderesses growing up amongst us is an increasing one, increasing not only according to the ratio of increase in the population, but in accordance to the pressure upon the means of existence, which every year bears more heavily upon the lowest class, from which our unnatural mothers are recruited. But in working out this sum we have only dealt with murdered children, who have been known to have lived some little time—babes, many of whom have sucked the maternal breast, when, as is well known, their chances of life are greatly augmented by the lighting up of maternal love. If we dared to speculate upon the amount of infanticide committed upon children just entering the world, and who are noiselessly interred as still-born, we should fear to name the annual total to which child murder would instantly spring up. The late Mr. Wakley used to observe that the number of infants who left this world on “washing days” was remarkable. The parturient woman, in fact, allowed her infant at the moment of birth to fall into a tub of water, and it was thus destroyed, without any of those indications of having breathed, which are required to prove that it had been born alive. Again, the list of still births is known to be largely augmented by the mere fact of the mother, at the moment of the infant passing into the world, remaining perfectly still and well covered over

by the bed-clothes, and by this means allowing it to poison itself in the pool of carbonic-acid gas in which it lies—to die in short of the few gasps it takes of its own breath. But there are still other means of extinguishing the life just as the child is entering it. A slight pressure upon the great arteries of the neck is sufficient, or a pressure upon the cord, puts out existence as speedily as a gaslight is turned out by turning a cock. Midwives wickedly inclined—and there are but too many of them—know well how easy it is to produce a still birth, or, in the horrible language of the craft, a “quiet one;” and that there is a trade carried on as systematically in this method of murder as Charlotte Winsor practised upon babes of a more advanced age, and in a more clumsy manner, is without doubt.

But the most monstrous fact is that, as far as the law is concerned, a woman may do this openly, and the law will hold her harmless. It is not murder to kill a child if the act is done while the little one is passing into the world, and not wholly detached from the mother. Indeed, provided the mother does not conceal the birth, she may commit murder in the face of the world, and defy judge and jury to do their worst. Women have been put upon their trials over and over again within the last few years for the crime of infanticide, and on the judge ascertaining the fact that it could not be proved that the infant was fully born

at the time, he has at once stopped the case, and directed a verdict of acquittal. It seems monstrous that while a woman is liable to severe punishment for bringing about abortion, she should be free to kill a child when arrived at maturity. The reason given for this anomalous state of things is, that in the one case the mother's life is endangered, while in the other it is not. In all Catholic countries, where the life of the unbaptized child is held of more account than that of the parent in a religious sense, this absurd distinction is not drawn. At the Social Science meeting held at Liverpool in 1858, Lord Shaftesbury said that no less than 60,000 still-born children came into the world every year; that a very large percentage of this number are made away with by foul means, such as we have described, is not doubted by professional men practising among the poor. They are never registered, no inquiries are made respecting them. Either some disreputable undertaker, for a few shillings, engages to dispose of them, sometimes keeping the little corpses on a shelf in an outhouse until he has accumulated a sufficient number to pay him for a single interment, or they are taken to the workhouse, huddled into adult paupers' coffins like so many blind puppies, and there is an end of them. That the birth of every still-born child should be registered, and, if possible, a medical certificate of the cause of death given, is of the utmost importance, and lies at the root of all

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efforts for the preservation of infant life. There are difficulties in the way, no doubt, but Dr. Farr, of the Registrar-General's office, distinctly states in his last report, that they are "not insurmountable." That a certain number of infants that breathe for the first time, are returned as still-born to escape the burial fees, and are consequently not registered, a fact that we have from the same excellent authority, affords another proof that non-registration opens the door to positive crime.

It is certainly strange that while the law takes every precaution to ensure life from violence in its embryotic and adult stages, and while religion is ever busy instilling into us a sense of its sacredness on all occasions, yet that we should knowingly clear the way for the murderess when the infant is on the very threshold of existence. The life of the race is certainly not stronger than its weakest part, and we wilfully leave open this point to attack. As in a vast majority of cases, there would be no infanticide where there was no previous concealment of the woman's pregnant condition—for it is the concealment which affords the temptation to make away with the child when born, and whom nobody expects. It would be curious to speculate upon the part crinoline has performed as an agent in bringing about the crime. We have no doubt this article of apparel, which covers a

multitude of sins, is rendered answerable for the commission of those of a deeper dye.

As many influential persons believe, and with truth, that poverty and shame are at the bottom of the majority of cases of infanticide, and that we shall correct the evil by the establishment of foundling hospitals, it is well to consider if such institutions are really capable of affording that protection to human life demanded, or whether they do not deliberately commit vicarious murder. It is needless to say that in all cases where foundling children are brought up by hand the mortality is frightful, ranging from forty to ninety per cent. In our Foundling Hospital it is apparently very light, lighter indeed than among the average infantine population out of doors ; but it must be remembered that this institution suckles all the infants under its charge—that is, it goes into the market and asks two hundred mothers in the counties of Kent and Surrey to sell their milk. Now, as one mother cannot afford more nourishment than is necessary for one child, we may guess at the mortality of infants of their own flesh they put away to be brought up by hand. This is nothing more or less than bringing about infanticide—an infanticide of the legitimate by their own parents impelled by want, that the illegitimate may live ; and it is, we think, an unanswerable argument against the establishment of foundling hospitals.

Still more immediately reprehensible is the infanticide brought about by fashionable ladies, who buy an alien nourishment for their children, lest their own figures should suffer in the performance of a function which maternal love should render sacred. We may shudder at the facts elicited by an inquiry into the workings of infant burial clubs, and fine ladies may wonder how the poor can be so unnatural as to destroy their own offspring for money, but do not many of these fine ladies themselves encourage them to do so by buying the life-blood of their little ones, and from the most paltry of all motives—vanity?

There is still another source of infanticide, of which the chemists and druggists practising in poor neighbourhoods could, if they liked, give a fearful account. We allude to the fearful habit among the very poor of drugging their infants with what in popular language are termed “quietners,” i.e., laudanum in its various forms and combinations. That numbers of young infants are by these means put knowingly into their last sleep, there can be no shadow of doubt whatever.

If, then, we take the number of infants who are found murdered in the metropolis and place them bodily in front of the stage, and then if we supplement them, as scenic painters do in theatres, by figuring on the canvas the multitude that perish by the other known means of infanticide practised, we shall make

up a group of murdered innocents which will account for a very large proportion of that amazing percentage of deaths which take place in the early months and days of infant life, according to the returns of the Registrar-General — a percentage that clearly shows that by fair and foul means the early stages of human life are devastated as ruthlessly as we find animal life is among many of the lowest forms of existence.

The girls who commit infanticide in the vast majority of cases are young servants, and the reason is obvious. The master's son, or the master's footman, are favoured with too many opportunities to give us hope that the first step towards the final catastrophe can be easily checked. The poor girl when she finds herself *enceinte* practises every art to conceal her condition, and it is this concealment which leads to the after mischief. In the country and among the factory girls, where indeed they live in their own homes, the fact of their having given birth to an illegitimate child is looked upon as a very mild offence—nay, in many cases its occurrence gives the mother the best chance of getting the father to marry her, inasmuch as the latter often waits to see in popular language “if it holds”—in other words, if the illicit connection is likely to be fruitful. The consequence is there is little infanticide. It is in the great towns, and especially in the metropolis, where domestic servants

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abound, that the crime is abundant. The girl who ministers to our daily wants in our own houses must appear to be immaculate, even if she is not; and the act of her giving birth to a child often comes upon us with a shock which paralyses our Christian feeling, and makes us do things which we should stigmatise as the height of cruelty if committed among savages. The poor creature finds herself turned out of doors and deprived of bread at the moment when an additional life is dependent upon her exertions—degraded in the eyes of her fellows, and weighted for the future with a burthen which drags her to the earth, in which condition her paramour is but too apt to leave her to her own devices. Can it surprise us that in a moment of weakness, she endeavours to extract herself criminally from the penalties of a position which are almost too hard for her to bear, and which the pharisaical spirit of society so complacently augments?

Professions of Christianity are plentiful enough wherever we go, but when tested practically they but too often break down. If mistresses would follow the teaching of their Divine Master, and where on such occasions to tell poor creatures to go and sin no more, instead of denouncing them as criminal with that bitterness which distinguishes the sex in all cases where sexual matters are concerned, we should possibly hear less of infanticide; at all events, those who have erred would not be cast out as things

accursed, and driven from among us, as they now but too often are, to the cruel alternative of the streets. Legally many things may be done to remove this terrible crime from our midst. It is certain that even where children have been murdered under circumstances of great cruelty, jurors have acquitted the unnatural mothers because the penalty is death. The dislike of inflicting the extreme penalty of the law in cases of this kind is so great that practically, as far as capital convictions are concerned, the law is wholly inoperative. Hence the juryman is always swayed towards the side of mercy in these cases, often to the prejudice of justice. He is allowed no choice between the penalty of death and the minor penalty of the concealment of birth, and he invariably finds for the latter. If the French plan—convicting upon the capital charge with “extenuating circumstances”—were permitted, such a sliding scale of punishments could be accorded as would be suitable to the case, and would, as far as punishment is possible, act as a check upon infanticide. The criminal mother should most certainly not be allowed to take advantage of the present condition of the law, which admits that a child may be murdered with impunity so long as it is not wholly detached from the body; and the present omission to register the birth of still-born children, which opens the door to so much wickedness, should no longer be allowed to exist. There are, doubtless,

difficulties in the way of registering still-born infants, but they are not insuperable, as Dr. Farr remarks ; and there can be no doubt whatever that a large number of children who now suffer death from violence just as they enter life would be saved if the fear of an adverse medical certificate were before the eyes of the mothers. Whilst we say this much on the side of justice to the child, we must not forget that the bastardy clauses of the new Poor Law Act press most cruelly upon the mother. Can anything be more unfair than the enactment which allows a mother only two-and-sixpence a week towards the support of her bastard child, obtainable often with great difficulty from the putative father, and often indeed denied to her through the difficulties the law throws in the way of his discovery ? It is simply monstrous that the man, who forfeits no social position by his complicity in the crime which ruins the woman, should escape thus unscathed ; however wealthy he may happen to be, the law should force him to contribute towards the support of the child, according to his means, and not according to a fixed sum to be levied upon high and low alike. If the poor-law authorities were empowered to enforce such equitable payment, it would very probably act as a cooler upon the licentiousness of the man, and it most certainly would deprive the woman of one of the strongest incentives to destroy her child.

## DO BAD ODOURS CAUSE DISEASE ?

THE tendency of the human mind to rest satisfied with any belief that is authoritatively asserted, is too well known to require any comment. Philosophers of all kinds are no more exempt than other people from this easy style of dealing with difficult problems. Medicine is, we think, especially chargeable with cherishing pet answers to questions that force themselves unkindly on her, and we think that the way in which she has made up her mind as to the causes of various kinds of fever, is an example of this style of cutting the gordian knot.

Of late years it must have struck all our readers that pig-sties, dirty pools of water, open commodes, ash-heaps, etc., have been declared highly criminal, and on all occasions even adjudged guilty of producing any kind of fever or bowel complaint that may have

broken out in the neighbourhood. If a child happen to suffer typhus in a farm-house, it is the mizen at the end of the barton that has caused it. If an epidemic of English cholera befall a village, it is traced to the duck-pond by the roadside. If in a wealthy household the inmates are stricken with diphtheria, some open sewer close at hand has, as a matter of course, been the cause. So accustomed are we to hear this sort of reasoning resorted to on all occasions, that one feels a little difficulty in expressing doubts as to the certainty with which the effect is thus unhesitatingly traced to its cause. Nevertheless, we think there is at least sufficient evidence to cause reflecting minds to pause ere they give in their adhesion to the general opinion, and thus shut their eyes to further research and inquiry. Dr. Watson has, we know, stated it as his distinct opinion that *neither animal nor vegetable decomposition is sufficient to generate fever of any kind*; and the researches of Dr. Guy and other observers have certainly gone some way to support that opinion. Dr. Guy, in his very interesting contribution to the Journal of the Statistical Society, on the 'Health of Nightmen, Scavengers, and Dustmen,' gives us a mass of statistical facts which, it must be confessed, run counter to the generally received opinion that foul animal or vegetable emanations are the fruitful source of disease.

This class of men, without doubt, spend their days

in the very midst of filth of all kind. Dr. Guy says, —“ In most of the laystalls or dustman’s yards every species of refuse matter is collected and deposited—night-soil, the decomposing refuse of markets, the sweepings of narrow streets and courts, the sour-smelling grains from breweries, the surface soil of the leading thoroughfares, and the ashes from the houses.”

This heterogeneous mass the scavengers or “hill” people have to sort, or to pass through sieves, so that the emanations arising therefrom must be brought into internal relation with their lungs and skin. If fever and diarrhoea are so clearly traceable to the vicinity of these so-called noxious materials, surely the scavengers ought to be a poor fever-stricken race. A medical examination, however, of this class of workmen, as compared with brickmakers and bricklayers’ labourers, proves that the scavenger is comparatively exempt from disease. Thus, among a number of men examined, in each of the three classes, it appeared that the numbers attacked by fevers were, among the scavengers, 8 per cent.; among the bricklayers’ labourers, 35·5 per cent.; and among brickmakers, 21·5 per cent.

This result seems extraordinary enough, but it may be argued that these men do not live in the laystalls or dustyards, and, therefore, that their exemption from fever may be attributable to this; but what can be said

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if the master dustmen and their families, who live all their lives in the midst of these heaps of so-called fever nests, are healthy? Dr. Guy says,—

“ I do not think that, whether in town or country, such another body of men (as master dustmen) could be brought together, except by selection ; and it is not going too far to assert of them, that if the comparison were limited to the inhabitants of London or our large towns, no score of selected tradesmen could be found to match the same number of scavengers brought casually together.”

Unless we suppose the scavengers get used to this so-called miasmatic atmosphere, or that after a time it no longer affects them, we cannot see how the foul emanation theory can hold water. Nature cannot work differently in one place to another. Night-soil must be just as deadly in an open yard in London as in the country. But here we have the experiment tried on a large scale of a whole class of men subjected to foul emanations, and yet they are far from being an unhealthy race of men, and are not nearly so prone to fever or bowel disease as the brickmakers' labourers. We are far from wishing it to be understood, however, that we do not consider foul emanations as dangerous or baneful under any circumstances. When we speak of foul smells, however, of course we do not mean simply disagreeable ones. We are ourselves living near a linseed oil-mill, and the effluvia, when the crush-

ing progress is going on, is simply disgusting, and many ladies affirm that it makes them sick merely to pass the doors. Nevertheless, the effluvia given out is full of oil, and consequently is very beneficial to sick persons, who benefit by the application of oil, either internally or externally. We give this only as an example among many others that the mere fact of a thing appearing disagreeable to the senses is no proof whatever that it is disadvantageous to health.

In our opinion malarious odours become noxious when much concentrated, and deprived of that great purifier the oxygen of the atmosphere. Our houses, for instance, are built on the principle of a bell glass, and our drains and commodes and all other impurities, if allowed to give off a confined miasma, most certainly do become most virulent sources of disease. But in the open air we think it very doubtful whether these emanations are ever the cause of injury to man.

Let us watch a still more gigantic experiment on the health of the Thames waterside people, which has been going on for years, and is still proceeding. The whole sewage of two and a half millions of people has, within these last five-and-twenty years, been turned into the metropolitan stream,—low down its flow, it is true. Year by year its waters have been more and more contaminated, and the filth that has escaped into it has, with the return of the tide, again passed up the stream. It should follow that the health of the

waterside community is proportionately decreasing; that febrile complaints, cholera, and diarrhœa are alarmingly on the advance. But this is far from being the case. The health of the river-side community has been exceptionally good of late, and no epidemic such as might from the sophisms of the sanitarians have been expected, has come to pass. The quantity of putrescent animal and vegetable matter in the Thames has been going on increasing, but the illness generally attributed to the emanations arising therefrom has actually been decreasing! We know that many will urge that all the combustibles (if we may use the term) being thus accumulated, it only requires the match to be applied, to find epidemics raging like wild-fire. But they have not; cholera, veritable Asiatic cholera, has been on board the 'Dreadnought' many times before she was broken up, but it has not spread. Cholera has broken out on the banks of the Lea, but it made no progress. It is nowhere sustained by evidence that the stench from the river or docks, however noisome, has in any way been productive of disease.

Greatly doubting, as we do, the alleged fatal effect of foul emanations *in the open air* upon human life, we nevertheless do not think that the crusade against filth should be for one moment relaxed. A bad smell may be no more unhealthy than a bad taste, but we should, if possible, avoid the one as much as the other. What

we should above all things avoid, however, is the falling into the error of supposing that bad smells are the indubitable sources of many puzzling diseases, and of thus hardening our minds against an unprejudiced and physiological inquiry.

Our own opinion is that putrescent matter, whether animal or vegetable, is only one factor in the problem of disease. There must be, we think, some condition of body on the part of the individual that enables him to receive this factor, so that the whole sum shall result in disease. It is quite clear that all the conditions which induce disease are rarely in the air and the body together, and until they are all there, the disease is not incubated. Our Boards of Health blunder along, and do service to the community in the steady course of their blundering, but it will require much further experience, or some happy accident, to discover the true shield to present to the attacks of epidemics arising from the evil effect of malarious diseases.

## THE PROGRESS OF ELECTRIC TELEGRAPHY.

AMID the honours which are deservedly bestowed on the men who have carried electric telegraphy to its last splendid triumph, the name of the Englishman who may be said to have first demonstrated the possibility of the instantaneous communication of intelligible signs by means of electricity, ought not to be forgotten. His story is a curious one. So far back as 1816, Mr. Francis Ronalds, after many years of study, devoted to electrical science, invented and constructed at Hammersmith, where he resided, an electric telegraph, by which he was able to send communications along a wire of eight miles in length; and having practically demonstrated its fitness for the transmission of messages, it occurred to him that it might be usefully employed by the Admiralty in lieu of the semaphore telegraph then in operation. He

accordingly wrote to the then First Lord, Lord Melville, stating the nature and objects, and practical character of the invention, and requested "either an opportunity of demonstrating its advantages by an experiment which he had no doubt would be deemed decisive," or, "an interview at which he could explain more particularly the nature of the contrivance." To this letter a reply, dated 29th of July, 1816, was received from a Mr. Hay, stating that Lord Melville had left town for some weeks, but had requested him to see Mr. Ronalds on the subject of the discovery if he desired it. Mr. Ronalds did desire it, and wrote to say so. But instead of the appointment promised, came the following remarkable specimen of the official "snub conclusive," from Mr. (afterwards Sir John) Barrows :—"Mr. Barrows presents his compliments to Mr. Ronalds, and acquaints him, with reference to his note of the 3rd instant, *that telegraphs of any kind are now wholly unnecessary, and that none other than the one now in use will be adopted.* Admiralty Office, August 5th, 1816." Discouraged by this rebuff, Mr. Ronalds did not press the matter further, but in 1823, being about to leave England for some years, he determined to publish his invention to the world, which he did in a pamphlet now before us, entitled 'Description of an Electrical Telegraph, and of some other Electrical Apparatus,' by Francis Ronalds. *Volante Nihil Difficile.* London, printed for R. Hunter,

St. Paul's Churchyard, 1823." In this pamphlet Mr. Ronalds gave a detailed description of his apparatus, accompanied with drawings, and explaining its practical operation. "Why," he says, "has no *serious* trial yet been made of the qualifications of so *diligent* a carrier?" And in a spirit which in days when "the fairy tales of science" were not in the same esteem as now, must have provoked the sneers of gentlemen of the type of the Admiralty officials, he continues—"And if he should be proved competent to the task, why should not our kings hold council at Brighton with their ministers in London? Why should not our Government govern at Portsmouth almost as promptly as in Downing Street? Why should our defaulters escape, by default of our foggy climate? And since our piteous *inamorati* are not all Alpheï, why should they add to the torments of absence those dilatory tormentors—pens, ink, and paper, and posts? Let us have electric conversazione offices communicating with each other all over the kingdom if we can."

It will, we believe, be admitted that Mr. Ronalds had by his invention established the feasibility of everything here indicated. A fair trial by the Admiralty in 1816 would, therefore, in all probability, have advanced the history of the electric telegraph. In any case its powers would have been exercised, and the world profited by its advantages long before 1837, when Cooke and Wheatstone took out their first patent.

Sir Charles Wheatstone, while he claims to be "the first contriver of the electric telegraph in the form which made it available for popular use," has always, we believe, broadly recognised the great merits of Mr. Ronalds' invention as explained in his pamphlet of 1823, as establishing among other things the principle of reciprocal communication, which is developed, to use Wheatstone's words, "completely and effectively." For this great service as a pioneer to one of the greatest inventions of the day, the Government in 1852 advised Her Majesty to grant Mr. Ronalds a pension of £75 a year!!! This is about the sum that a retired butler of some noble lord would have got from the privy purse; indeed, it is just noted in the papers that Lord Byron's servant has been put upon the Civil List for a sum very little inferior. It would be interesting to know at what my lords really estimate the value of a world-wide invention, which, if it does not affect themselves exclusively, includes them in a vast benefit to the whole human race.

Whilst, however, the first step of Ronalds was very valuable as a suggestion, it required the help of many minds before *all* the materials were at hand to make a perfect instrument, and then it required the master mind to put these materials together in the most economic manner. Volta, in 1800, invented the Voltaic battery, in which by a combination of zinc and copper-plates, bathed in sulphuric acid, he was enabled

to transmit from one pole of his battery to the other, by means of a conducting wire, a powerful flow of electricity. Thus two steps in the process were completed. In the year 1819 Oerstead had made the discovery that a magnetic needle is deflected by the passage of a circuit of electricity through a wire parallel and in close neighbourhood to it. Thus the three factors were ready to hand when Professor Wheatstone began to experiment upon his great project, the needle telegraph, which is the instrument in use in this country now upon the railway lines by the railway companies. These experiments were made by the Professor in the gloomy vaults of Kings College, where he had insulated four miles of wire. In this gloomy trial-ground, *the* great invention of the century was indeed perfected. In the course of his experiments, he discovered that to deflect the needle at any great distance Oerstead's discovery was worthless—more driving power was required, and this increase of power was given by the application of Schweigger's invention of passing a great number of times, in immediate proximity to the needle, a wire thoroughly insulated by a serving of silk. By this means the deflecting power of the current is greatly multiplied, and the sensibility of the instrument increased.

Thus it will be seen that very early in the century the scientific steps towards the construction of the

new agent had been realized. Even as early as the middle of the last century Dr. Watson showed, by experiments on Shooter's Hill, that a shock of electricity could be passed along a four-mile circuit without any appreciable loss of time; but there was a loss of time, and Wheatstone, early in his experiments, set himself the task of measuring the exact amount of this loss. This he accomplished by means of a rapidly revolving mirror, upon which the passage of the electric fluid, at different and distant parts of a severed wire, was indicated by sparks, which appeared as lines of light on the rapidly turning glass. By means of this instrument he made it evident to the eye that one spark or leap of the electric fluid did occur before the other, thus proving that its transit along the wire was a matter of time. But how was this infinitesimal period to be measured? He constructed a metal humming-top, which he attached to the spindle of his revolving mirror; against this he directed a strong current of air, and the pitch of the sound produced was a measure of the velocity attained. By this means he measured the speed of the electric flash,—that it travelled with the velocity of light; this was along a copper wire, whilst along iron wire suspended in the air its progress is slower, or not more than 15,400 miles per second. For this reason, where speed is required, as in long lengths of submarine cable, and in the underground metropolitan

lines, the conductor is always of copper, whereas in shorter land wires iron is used, as both stronger and more economical in regard to first cost, and the temptation it holds out to thieves. Copper wire in exposed places, as along the railroads, would, we fear, soon disappear, and, of course, with it, the voice that speaks for us. We may also add (by way of digression) that strength sometimes necessitates the use of the cheaper metal; for instance, in India and other tropical countries, wild animals, such as monkeys, and heavy birds, such as condors, storks, etc., make perches of the wires; hence the necessity of making them of rod iron, sufficiently firm to bear the great weight put upon them.

As we have before said, the underground lines, which we now and then see exposed in the streets, either for repairs or for the purpose of laying down additional wires, (and we are informed that it is for the latter purpose that the pavement is so often pulled up,) are always formed of copper wire, speed being the great necessity. It must be remembered that in great cities time is of the utmost importance. Time bargains especially require the swiftest passage of intelligence. For instance, the largest number by far of messages are passed by stockbrokers, who possess a line of their own running beneath our feet with the public conductors. It is curious to notice that it is found that the greatest number of failures in this par-

ticular line is caused opposite bakers' shops, in those places where, by reason of the great heat of the bake-houses, the pavement is nearly always dry. This great heat causes the insulating composition to melt, whereby the wires get into connection with each other, or allow the damp earth or water to pass the electric current into the earth, and thereby spoil the passage of the message. For this reason the wires are passed out into the street, so as to avoid such cause of impediment. When these failures occur, it is easily found out by means of the testing-boxes placed about a hundred yards apart, which enable the workman to find out within that distance the cause of failure.

By means of these two systems of electric wires—those running beside the railways throughout the country, which contain on the same poles the set devoted to the railway system, and those devoted to the public circulation of messages,—the whole country is covered above and below ground by a great cobweb, as it were; those passing through the air composed of large meshes, those passing under the pavement of very finely reticulated meshes, which permeate every street and alley of the great metropolis. Besides these, there is the third system of submarine telegraphs. When the Admiralty, in reply to Mr. Ronalds, stated that in times of peace telegraphs were not required, and in times of war the old semaphore served every required purpose, it showed how utterly behind the

age were their views of the question. Telegraphs not required in times of peace!!! What would the stock-brokers say to such a dictum? What would tradesmen think of such a narrow view? What would private individuals, moved by some sudden grief or misfortune, think of the stupidity which would, if it could, have cut them off from help or succour in sudden emergencies? As far as the State is concerned, when a few days more or less may open the doors of peace or war, imagine us restrained to the use of the old cumbrous semaphore! It is not long ago that some millions of money were saved to the State by reason of the arrest of troops that were to be despatched from Canada. When the dreadful mutiny broke out in India, what would the country not have gained by the two lines of telegraph which now put us in instant communication with that vast empire?

It is easy, no doubt, to moralise after the event; but what is the value of a government if it cannot foresee an obvious advantage? It cannot be denied that the power of the telegraph will entirely alter the whole system of European politics. Sudden wars can no longer arise.

The two great nerves which, within these last few years, have put us in instant communication with our great Eastern Empire, and knit together intermediate dependencies, are of priceless value to the country. Of these the Indo-European line runs by way of the Persian

Gulf to Kurrachee, and thence to Bombay, from which port it finds its way to Australia, and puts us in communication with our great military and industrial empires, where our New England is slowly being built up. The other line—the second string to our bow—the Red Sea or Eastern Telegraph Company, which is the rising line, inasmuch as it is the safer, by reason of its going by a submerged route, starts from Cornwall, touches at Gibraltar, Malta, and passes down the Red Sea and the Arabian Sea to Bombay. These two telegraphs, in conjunction with the Atlantic cable, put us in communication with the two hemispheres, and, together with the land lines, will before long put a girdle round the earth such as Shakespeare's Puck might have fancied, but which that great genius never could have contemplated would have been transmuted into a fact. These great sea lines, independently of their safety from the attacks of enemies, are less liable to danger from other sources than land lines. Too deep for injury by human means, the only danger they incur when deeply submerged is from the attacks of boring worms; of these there are two different kinds, one which attacks the hempen covering, and the other the gutta-percha. Between these two, however, the sheath of iron wires intervenes and acts as a defence; and it has not yet been proved that any deep cable has been injured in its isolation in consequence of their attacks. In fact, in the open ocean they may be considered safe

except from the natural decay caused by time. The dangerous places for a cable are grounds near shore, where it is liable to be dragged and broken by ships' anchors; but the more powerfully armed cables are even proof against these, except under the immense strain of an anchor pulling in a gale of wind.

America is the only country that has taken to the telegraph with equal if not superior energy to the Briton. Her lines of wire, in fact, surpass our own greatly in length; but they have to encounter difficulties from the hand of man from which ours are exempt. They have to pass through vast stretches of pine forests, where they are liable to be injured by the falling trees. For some reason with which we are not acquainted, they never run beside railroads as ours do; therefore they neither have the protection of the officials nor the advantage of cleared ground. It is true, watchers are posted at every twenty miles distance, who are continually patrolling the line, but can be no protection against a sudden storm, during which numbers of the poles from which the wires are suspended must be overthrown, and the current thereby broken. But the expense of their construction is vastly less than it is in England,—hence the rapidity with which they are constructed. The same may be said of our own lines in Canada, where the whole country is traversed with lines which cover upwards of four thousand miles of country, all of which lock into the

American system. Both the United States and the Canadian lines are greatly cheaper than the English ones, notwithstanding the great reduction in the tariff in consequence of their being purchased by the Government. When this purchase was made, the country had to buy up, at an enormous cost, the rights of the private lines. This first charge drags very heavily, and at the present moment it is reported on very good authority that our telegraphic system does not pay. When the shilling tariff was instituted, it was supposed that, like the reduction of postage to a penny, the enormous increase in the number of messages carried would greatly increase the revenue ; but it seems to have been overlooked that, whilst the mail-carriage can carry any manageable number of letters for a very little additional cost, the wires cannot do the same. The low tariff has put such pressure on the staff that the wires often cannot carry the messages entrusted to them ; and in order to meet this difficulty, not only the wires will have to be doubled, but the telegraphists will require to be largely reinforced. What this will cost may be judged by what we have already spent upon them. If, indeed, a speedier transmission could be ensured, this would in some measure meet the difficulty, but only for a time, as the correspondence of the country is growing every moment ; and we may anticipate a time when a very large portion of our written correspondence will find

its way to the wire. If we could only introduce some cipher which should be easily understood and transmitted, no doubt the demand upon the wire would be tremendously increased at once. The present ciphers are not simple enough ; for instance, the plan of using figures instead of words, or of using a code of words of a different nature but equivalent for those required by some prior mutual arrangement.

In America this system has been tried, but it has not fully succeeded. In New Orleans, for instance, if a correspondent wishes to inform another merchant in a distant city of the prices and the prospects of the Cotton Market, instead of saying, "Cotton eight quarter ; don't sell," he may use the following :— "Shepherd-rum-kiss-flash-dog." This would be very confusing and would only work when a few words are required to be used. Sir Charles Wheatstone has invented a cipher-telegraph ; but the fact that it is but rarely used, especially in private life, is the best proof that can be urged that what we require has not yet been supplied.

## HOW OUR MILLIONS CIRCULATE.

Not many years ago the Londoner looked upon the crowded condition of our great city thoroughfares with a certain pride; it was the outward and visible sign of that vast commercial activity which, without doubt, places it in the foremost rank in the world as a centre of trade. But our pride in this particular is becoming rather expensive; the traffic toiling along the great channels of communication throughout many hours of the day is brought to a stand-still, and we scarcely dare estimate the cost at which we gorge the leading lines of streets with that procession of railway-vans, waggons, cabs, and omnibuses, which we bid the visitor note with so much pride.

Never was the old saying, that "we may have too much of a good thing," verified more completely than by this matter of City traffic, or vehicular

congestion, if we may invent a phrase for the nonce. The great emporium of trade has been making blood too fast, and now its heart has become so overburthened that it can scarcely perform its function. We are no longer proud of this plethora; indeed, we should only be too glad if we could get rid of it; but this is a matter which is just now puzzling the heads of those in authority, and we fear will continue to do so for many years to come. Assuming that upwards of three-quarters of a million of people enter and return from the City proper, the area of which is only six hundred acres; — an army moving about on foot and on wheels, larger than ever followed the leading of any conqueror, within the limits of a moderate-sized farm; — can it be wondered at that every five minutes in the day the crowd of vehicles in Cheapside and the Poultry stand as motionless in the streets as though seen in a photograph, whilst the tide of human life is running on the footways like the water in a mill-race? Could we back the line of houses in our great streets as we back a line of infantry, the traffic would run fast enough; but, alas! land in the City is bought only for its weight in gold.

Whilst the only remedy for the evil is so costly, and so tardy of accomplishment, the evil is growing day by day. Twenty-five thousand vehicles pass through the narrow gorge at Temple Bar; twenty-nine thousand along Holborn; and these two streams, besides

innumerable rivulets from side streets, mainly find their way along the Poultry, not more than thirty feet wide in its narrowest part! Can we wonder that Parliamentary committees have long puzzled their brains to find a remedy for this terrible state of things, or that the remedy seems as far from being arrived at as ever? The report of the last select committee which attempted to digest this tough problem just hangs the question up as it was before. The City people were desirous to bring in a bill to regulate their portion of the metropolitan traffic only, but this would clearly meet only a part of the evil, inasmuch as the City is completely embedded in the area of London at large, which stands over fifty square miles; it is the kernel to a very large nut; all its main streets are but the termini of roads, which radiate in every direction through the surrounding metropolitan area. To give it a special system of regulation as regards traffic, appeared therefore to the committee to be an error, and the last attempt to make the City streets run, comparatively speaking, free, is hung up for an indefinite period. The report gives us one suggestion, however, which is worthy of consideration. Mr. Peake Knight, the traffic superintendent of the South Eastern Railway, has viewed the problem to be solved from a new point of view. The main cause of the stoppages in the City thoroughfares is caused, as he very justly says, by the intersection of the main

thoroughfares. Let us instance the bottom of Ludgate Hill, where Farringdon Street and New Bridge Street cross Fleet Street and Ludgate Hill at right angles; Cheapside again, where it is cut by King Street and Queen Street, and more significantly still Lombard Street and Fenchurch Street, where it is intersected by Gracechurch Street, and a perfect congestion of the traffic is thereby produced. Mr. Knight would treat these streets as he would treat those portions of a line of rails, crossed by ordinary roads, on the level, and thereby prevent, not only the collision between two streams of vehicles moving at right angles to each other, but also the very great difficulty at present experienced by pedestrians in crossing from one side of the street to the other. Bridges and tunnels under the road, have, we know, been suggested to obviate the latter difficulty; but in order to make them practically useful, the approaches to them would require to be long—so long, in fact, as to make their construction almost impossible. Appointed crossings on the level, is, therefore, suggested by Mr. Knight, to be worked by semaphore signals.

“The semaphore signals in question should be worked similarly to the mode in which they are worked upon railroads, viz., the arms by day, and lights by night, to show at ‘caution’ towards the vehicle traffic in each direction, thereby denoting that such traffic must pass over the crossing at a cautious or

careful speed—say, walking pace. In order to afford the public an opportunity of crossing over the street at stated intervals, the signals could be raised to stop or danger position, against the vehicle traffic. The signals may be worked at stop as I have before explained, say for thirty seconds in every five minutes, which would give an allowance to the crossing, say of six minutes, distributed at regular intervals through every hour, or any other interval that may be agreed upon. The semaphore signals could be worked by the policeman in charge of the crossing, who (as on railways) could work the signal-post opposite him by a wire laid under the street pavement.” These semaphores he would, for economy of space, combine with the street lamps. With a machinery of this kind Mr. Knight is of opinion that the places of refuge so abundantly instituted of late could be dispensed with, as they take up a great deal of valuable room. But these arrangements after all, are only palliatives, and in no manner do battle with the great difficulty—the over-crowding of the great City thoroughfares—for it is here the evil has become so glaring. The Chief Commissioner of Police, it is true, thinks that the cross-traffic at Piccadilly Circus, and the cross-traffic at Charing Cross, and at Albert Gate, and Hyde Park, are equal to anything to be found at the junction at Farringdon Street and Bridge Street, or at Fenchurch Street and Bishopsgate Street; but this surely is a strange miscalculation. Palliatives, as we

have said, may come in to supplement some radical measure for the multiplication of the means of passing the vehicular traffic through the limited area of the City. Within this six hundred odd acres upwards of three-quarters of a million circulate, mainly within the hours of nine in the morning and six in the evening, and the vast majority of these people are non-resident.

The inhabitants of the City proper are year by year decreasing. In 1851, for instance, there were 129,128 inhabitants residing within its boundaries; but this number had declined in 1861 to 113,387, and probably in 1876 the population of the most renowned commercial city in the world will not amount to 100,000, or less than the number of people living in Kensington. The army of people, principally male, that moves on the City every morning, is perhaps unparalleled in number by any human tide that has ever moved diurnally in any city in any age of the world. The difficulty of dealing with such a vast influx, pedestrian and vehicular, is increased in consequence of the narrowness of the streets within its area. These, it is true, constitute about 23 per cent. of its entire area, 913 public ways traversing it in every direction; but of these only 194 have sufficient width for one line of vehicles only, and 174 in addition are without thoroughfares. Thus, it will be seen, that upwards of two-thirds of the City streets are incapable of carrying any considerable stream of vehicular traffic

at all. There are only 86 which admit of two lines of vehicles, and 68 which admit of three or more. But, practically, the main stream of people coming into the City in the morning find their way along two lines, Fleet Street and Newgate Street, the two thoroughfares mingling at Cheapside, and coming to a dead lock throughout the greater part of the day at the Poultry. The obstruction which here takes place should and would have been removed long ago, but for the almost priceless value of land in this locality.

Hitherto the introduction of railways has aggravated rather than relieved the circulation, vehicular and pedestrian, within the City proper. Pedestrians, for instance, have to be taken to the different termini in cabs, and the heavy traffic has to be passed from station to station in vans, which greatly impede the light traffic. Much of the railway circulation stops, in fact, on the outskirts of the City, and until through-routes between the different lines, north and south, and east and west are completed, the congestion will continue, or even increase, to judge from the fact that numbers of vehicles entering the City by the eight principal entrances, between 8 A.M. and 8 P.M. rose from 48,922 in 1850 to 76,564 in 1865, more than 56 per cent. in fifteen years. Thus City men have seen the crush of vehicles more than doubled within a few years, whilst no means whatever have been taken to

widen the capacity of the streets or to form new ones. Here and there, it is true, we find a house thrown back a few feet in some great thoroughfare ; but it is quite clear the traffic is increasing at a pace far faster than can be met by such a tardy process of enlargement. The pedestrian element is more manageable ; but year by year it is increasing, and the streets which form the main entrances to the City can scarcely carry more than they do at present.

In May, 1860, within twenty four hours, 289,148 persons entered the City on foot by eight inlets. A table of these streets will give the reader at a glance a measure of their values as traffic carriers. They are as follows :—Aldgate High Street, 42,574 ; Aldersgate Street, 21,060 ; Bishopsgate Street Without, 34,160 ; Blackfriars Bridge, 31,642 ; Finsbury Pavement, 27,024 ; Fleet Street, by Temple Bar, 36,950 ; Holborn, 41,610 ; and London Bridge, 54,128.

This is the number for twenty-four hours ; but during the twelve hours from 7 A.M. to 7 P.M. the numbers were 210,418 ; thus far more than two-thirds of the pedestrian traffic took place within the day, and the greater proportion even of this traffic passed along in the morning and evening. At certain seasons of the year the West-end of the metropolis is almost as crowded as the City ; but the average width of the streets in the fashionable quarter and the seat of the legislature is nearly double that of the City streets,

and stoppages of more than a few minutes are of rare occurrence ; indeed, during half the year the West-end seems only half-populated, and without a carriage-traffic in any degree commensurate to its miles of splendid houses and acres of fine squares.

But the great question is, how shall we correct the congested condition of our thoroughfares, especially the City streets ? Mr. Hayward, the City Surveyor, advocates the construction of an entirely new street running between the West-end and the east, for here the traffic is greatest and the means of carrying it is the most deficient.

He says : “ I propose a new street, seventy feet in width, starting from the east end of the Holborn Valley Viaduct, by St. Sepulchre’s Church, and terminating by a junction with Whitechapel High Street, close to Commercial Street. It would start from the west end of Newgate Street, and would be carried eastward across King Edward Street and St. Martin’s-le-Grand, north of the General Post Office. It would then proceed, bisecting Noble Street, Wood Street, Aldermanbury, Basinghall Street (north of Guildhall), and Coleman Street to Moorgate Street, at which spot it will be 250 yards north of the Bank. Thence across Little Bell Alley and Drapers’ Buildings to London Wall and Wormwood Street (the northern side of which streets would become part of the northern side of the new street), up to Bishopsgate Street Within.

Thence, still proceeding eastward, it will cross Houndsditch and Petticoat Lane and proceed to its junction with Whitechapel High Street near to Commercial Street. Immediately opposite to this termination will commence the new street, projected by the Metropolitan Board of Works from Whitechapel to the Commercial Road, and the two streets would be a continuation of each other in a straight line." Liverpool Street, close at hand, is to be the new terminus of the Great Eastern ; and we are told that no less than four railway termini will be concentrated at a spot about 110 yards distant within a few years. This new line of road, of an ample width, would certainly relieve all the traffic proceeding north-west and south-east, without going through any valuable property, or interfering with any crowded thoroughfares, and it would turn the flank of the streets now most crowded—such as Newgate Street and Cheapside. The crowded north and south traffic, in the opinion of the City Surveyor, is only to be met by the building of a new bridge lower down the river than London Bridge, east or west of the Tower.

It must be remembered that there are two easements to London Bridge—the conversion of the Thames Tunnel into a railroad, and the projected pneumatic railway between Billingsgate and the opposite side of the river. These lines, together with a new bridge, would meet the requirements of a north and south traffic

across the river for another quarter of a century. We question, however, if even two main thoroughfares running north and south will meet the requirements of the City traffic. Business has so settled down in certain routes that it cannot well be diverted from them. It was imagined that the construction of Cannon Street would relieve Cheapside of half the traffic going over London Bridge, and all the omnibuses taking the latter route were ordered to make the short cut; but the omnibus proprietors very truly argued, that passengers wanted to be set down in business thoroughfares, and not to make short cuts; consequently in answer to the police regulations, the omnibuses were stopped at the Exchange, rather than be sent down Cannon Street. This arrangement for omnibuses was in fact one of the police regulations of the City police. There were two other City police regulations which were rendered equally ineffectual by the stupidity of those who framed them. One of these was that no person should drive any "cart, waggon, dray, or other vehicle for the conveyance of goods, wares, and merchandise, through the streets between the hours of nine in the morning and six in the evening, laden to a greater height than sixteen feet, or laden to a greater width than seven feet," but this bye-law was rendered totally inoperative by the proviso that all carriages of this description in existence before the 28th day of July, 1863, should be exempt! As regards the passenger

traffic, it is clear that since the present thoroughfares cannot carry it, we must supplement it with a second story of street-railways, running under ground. We have seen the enormous number of passengers that are now being carried by the Metropolitan Railway, notwithstanding its round-about course. Last Whit-Monday, for instance, it carried upwards of a hundred thousand persons. Yet this number is nothing to what a line may be expected to carry that has stations opening into the main thoroughfares. Who would as a rule ride by omnibus when pressed for time if a line of rails ran under the Bayswater Road and Oxford Street? Imagine Fleet Street and Cheapside supplemented by an underground road, and then what would become of their present crowded condition. It may be urged that the existing impediments are not to pedestrians, but to vehicular traffic. This is true to a certain extent, but we see no reason why our underground lines should not be utilised for goods as well as passengers. A greater part of the obstruction in the streets of the City arises from the unloading of carts by the side of the curb, and the passage of railway vans loaded with goods proceeding from one terminus to the other. May not much of this heavy traffic be conveyed in the night, and removed to the warehouse early in the morning? The underground rail is now silent after twelve o'clock; this is surely a great waste of a very valuable thoroughfare, such as we do not

find in any other line in the kingdom. We were promised, indeed, that vans would disappear from our streets when this subterranean road came into operation, but we now know how badly that promise has been kept. The dead block which takes place in the streets of the City is in some measure due to another piece of mismanagement which is capable of instant correction. Why should there be special railway cabs at all? and why should it be made compulsory on them to stand only on their particular railway stand? At present a cabman belonging to the Paddington Terminus cannot, after setting a fare down at the Euston Square terminus, wait upon the cab-stand in that building,—he must return empty to Paddington; and of course as he does so he lingers on the road, to the impediment of the traffic, in order to catch a new fare. “He crawls,” as the police term it, filling our streets with “slow coaches,” which utterly disorganizes the legitimate traffic. There should be no cabs hampered by special regulations. If railway termini are good “waiting-ground” for passengers, there cabs, if allowed fair play, would be sure to be found.

In many cases traffic in the City is congested in consequence of an old condition of things continuing, which is no longer applicable to present circumstances. It is only a few months ago that Farringdon Street at certain times in the day was rendered impassable by the passage of herds of cattle and sheep. Under

the pressure of the cattle plague, it is now found that we need not even kill our meat in town, and Newgate Market, which receives its supplies from the country, is so arranged that its business is all over by nine in the morning. At Billingsgate, on the contrary, all is confusion for many hours in the day, simply because a water-side market is made the centre of the traffic, notwithstanding that fish has ceased to come by water in large quantities for many a year. The warehouses of the fish salesmen, it is true, are still located in the streets leading to it; but this is simply owing to the fact that it is still the only wholesale fish market in London. If any line of railway having a fish traffic were to be supplemented by a market near its terminus, it would be much more convenient to the public, and the van traffic which now impedes the streets would be very materially diminished.

Colonel Frazer, the City Commissioner of Police, thinks that if all the wholesale meat traffic of the metropolis can be got over by nine o'clock in the morning, as it now is at Newgate Market, the same regulations may be extended to other markets; and doubtless with one or two exceptions, such as the fish market, which depends upon the arrival of trains, this may be done. But we suspect the difficulty the City Commissioner has to contend with is the fact that many of the members of the Corporation are interested in preventing some of the regulations from

coming into operation. For instance, it is idle to complain of waggons making an obstruction, and fining them for so doing, whilst Mr. Bennet is allowed to gather a crowd four times every hour in the narrowest part of Cheapside in order to see Gog and Magog strike the hours and quarters; but Mr. Bennet belongs to the Corporation, and may do a thing forty-eight times a day that a poor orangewoman would be mulcted of her whole worldly goods for doing only once.

There can be little doubt that one of the main causes of the stoppages of the streets in the City arises from the unloading of carts at the side of the City warehouses. Cannon Street, for instance, although a fine thoroughfare, is rendered a comparatively narrow one by the constant standing of these carts by the roadside. Colonel Frazer thinks that the warehousemen may be called upon to work at early hours, as the meat salesmen are, and that if this were done, these carts may be got rid of altogether, which would be equivalent to widening the street. But a regulation of this kind must come from some authority wholly independent of the City; for one of the difficulties at present existing with respect to meeting temporary emergencies in the City, is that nothing can be done until the Court of Common Council have assembled, and have agreed as to its orders. In the metropolitan district, on the con-

trary, Colonel Henderson acts immediately under the direction of the Home Secretary, and in many cases on his own responsibility alone. The wisdom of the select committee in deciding that it would be unadvisable to pass any bill that did not treat the metropolitan traffic as a whole cannot be doubted. As the Chief Commissioner of Police justly says, there is nothing in the City traffic which renders it exceptional to the rest of the metropolis, unless it be its more congested condition, and even in this respect it is almost rivalled by some of the leading West-end streets in the season, or perhaps on some other particular occasions. For instance, Regent Street, about four o'clock in June, is blocked with vehicles as hopelessly as Cheapside; but then the cross traffic is far better arranged. In the West, all leading streets at right-angles are built with a circus, which gives ample room for the crossing of vehicles. Possibly the traffic at the junction of Oxford Street with Regent Street is as dense as that which is always coming to such a dead lock at the bottom of Fleet Street; but we scarcely ever remember the cross roads at the former interrupted for a single minute by the conflicting lines of traffic.

The formation of a circus at these crowded crossings appears to us to be by far the most effectual remedy, and we are glad to see that their formation has commenced. The general idea is that the greater number of accidents which happen to pedestrians at the

crossings occur in the crowded parts of the City where bridges and tunnels have been proposed to be made, but the fact is far otherwise. The vehicular traffic in the City is so dense that few people are run over, compared with the less frequented parts of London. Where cabs and carriages are so thick that they must move slowly, it is easy to pass between them ; where, however, the traffic is moving at different rates, as in the West-end, a person crossing between two vehicles is likely to be cut off by a third passing at a different rate. In the City proper there is but little furious driving, and from this cause but few persons are run over. For instance, during the fourteen months from January, 1865, to February, 1866, we find that, within the City district there were only 17 fatal cases arising from this cause, and only 237 instances of bodily injury ; whilst in the metropolitan district, within the same period, 163 persons were run over and killed, and 1,938 were maimed and injured from the same cause. It is quite clear that furious driving can only take place where there is a clear road ; hence it is only possible in the suburban districts. Thus we find that from the 1st of January, 1865, to the 30th of November, 1865, whilst only five drivers were apprehended on this charge in the Westminster police district, 59 were so charged in the Stepney district, and 52 in the Islington district. Holborn, again, had only six cases, whilst Highgate

had 26—thus it will be seen that the danger from furious driving increases the farther we get towards the metropolitan outskirts, and that it diminishes to the vanishing point in the very heart of the City, where three-quarters of a million of people are attracted day after day by its wealth, and withdrawn as diurnally by the attractions of home in the quiet suburbs of this immense Babel.

## SELF-HELP FOR THE AGRICULTURAL SICK.

IN the year of grace 1859, in the small village of Cranley, in Surrey, a little seed was planted, which is, we think, destined to bear fruit throughout the length and breadth of the land. The village surgeon bethought him that it was certainly a mistake that the means of ministering to the accidents and diseases of poor human nature should be confined to great cities and populous places, and that the intermediate country, sometimes fifteen or twenty miles distant, should be altogether left out of the reckoning. In the great metropolis, and in every large city and county town, there is a hospital, or dispensary, in which nearly every malady to which the human frame is liable is specially attended to; but in the large tracts of country between these

centres of civilisation there is, or was, no refuge to which poor creatures suffering from the terrible accidents consequent upon the introduction of steam machinery into agricultural pursuits, and the railway, could be taken but the Union workhouse. And to that refuge the peasantry, who are not in any degree above the condition of paupers, decidedly objected to go. The consequence was, that the severe cases of injury were either removed to the County Hospital, or to the nearest city where similar establishments could be found. Even paupers were, and are still, hurried up to town, with a view to save the rates; and many a poor creature has, after much preliminary agony, lost his life, lest the parish should have to pay the extra fee allowed to the Union surgeon under such circumstances. Where it is possible, the sufferer can be treated, it is true, in his own cottage; but imagine a poor wretch with a fractured leg, or some accident involving the nervous system, shut up in the single sleeping-room of his cottage with noisy children, subject to the barbarous, because untutored, nursing of his wife. In either case, his chances of making a rapid recovery are not encouraging. If taken to the nearest town hospital, often from fifteen to twenty miles' distance, in a rough cart, the injury necessarily becomes so aggravated, that in many cases the limb is lost, and, with the limb, the patient's life, as the atmospheric con-

ditions of large towns are always adverse to the recovery of unacclimatised country patients. If, on the other hand, he is left to the better air of his cottage, he is, possibly, miles away from his doctor; and a case that requires watching every hour, under the best circumstances gets a visit from that hard-worked individual once a day. It was not an unnatural idea that led Mr. Napper, of Cranley, to the conclusion that we might bring the hospital system, so to speak, to the door of the poor man, and—a matter of no less importance—to his own door also. The rector of the parish, the Rev. J. H. Sapte, worthily seconded him by giving him a cottage rent-free, which, with the aid of the neighbouring gentry, was furnished and fitted up to receive six patients. As this hospital is the model on which all the subsequent establishments have been founded, it may be as well to describe it. It is a Surrey cottage, and nothing more, with a sound roof and sound walls. The interior is in the same homely style. The walls are whitewashed, the ground-floor is paved with brick: even the gude-man is sitting by the fireside, taking his rest after his day's labour; for the woman who attends to the patients is wisely permitted to have the "encumbrance" of a husband. There is a patent kitchener, it is true, but this is provided for the convenience of cooking, or for the purpose of supplying a hot bath,

which we see through the half-open door of a closet. In the sitting-room there is a poor boy playing on the floor, suffering from a disease in the bone of his leg. He looks very unlike the poor squalid town child, under such circumstances, primly sitting on his bed. At the side is a little room, in which the doctor sees out-patients. Upstairs are the wards for men and women. They can boast nothing beyond those in the simplest cottage, but they are scrupulously clean, and you can see that, were possible, ventilation is carried out. The nurse is a better-class country-woman. Her homely gown, her homely speech, remind the poor sufferer of those he has left behind. He looks out of the latticed window upon a little garden, and when the wind blows, the roses tap against the window-pane. We miss altogether the long prim ward, the prim nurse, the bare, dismal walls of the regular hospital. The patient, if his anguish would only leave him at ease, feels as much at home as though he were visiting a friend's cottage, and he entirely loses the idea, so painfully thrust upon him in the regular hospital, that he has ceased to become a man, and is simply looked upon as a disease. Can the reader wonder at the repugnance of the countryman to be in a town hospital, when he knows that he will no longer be John Stiles, but "a case of necrosis," or "a fatty tumour"? Is it strange that he loses his identity when mixed up with a long row of sufferers,

upon whom a grim silence is enjoined ; that he longs for the sight of a familiar face amid the crowd of students, who watch him as they would watch the experiments made upon a mouse in the exhausted bell-glass of a lecturer ; and, finally, is it surprising that poor Hodge, when hit hard, begs the doctor to let him die at home, where at least he has friendly sympathy.

Such a home, socially, is the Village Hospital, with the addition of all the appliances of art necessary to his case, and the doctor within call when his services are required. That the scheme was a success the moment it was practically at work was only a consequence of the simplicity of its arrangements, and its harmony with all the previous habits of the patients. At the outset it was determined that no cases should be admitted that could be treated at their own homes, and that, as far as possible, the hospital should be self-supporting. The Englishman, untouched by the degrading influence of pauperism, does not care about being tended gratuitously ; at all events it is found that the charge for his maintenance is cheerfully paid according to his means. The charge varies in various hospitals from 3s. 6d. to 10s. per week. This sum is contributed by friends and by the club, and in this manner almost a third of the weekly payments is made up, leaving a very moderate sum to be subscribed by those charitably inclined in the neighbourhood, in the

form of donations and annual subscriptions. The lively sympathy of friends is always a matter to be checked rather than encouraged. We all know what trash visitors are eased of, by the hall-porters in our Metropolitan hospitals, which they would surreptitiously convey to their friends. In the country, however, this willingness to tender aid is turned to account: the newly-laid egg is permitted, with the approval of the surgeon, to reach the patient; the pat of butter, the wine sent by the mistress, the beef-tea coming to an old servant from the "big house," are not ruthlessly withheld; and the patient in these little attentions finds that he is still linked to friends outside by all the ties of affection. Who shall say what is the value of these natural aids to recovery? We certainly do not under-estimate their value, neither do we think the reader will. In looking over the annual reports of those Village Hospitals which have been established some time, we cannot help being struck with the willingness which neighbours exhibit in supplying the needs of the sufferers. The tradesman, for instance, gives his time for some little odd job; the gentry supply wines or delicacies in abundance, and books; and the housewife supplies old linen. The classes in a village and its neighbourhood are so linked together that the thrill of sympathy runs swiftly through the whole chain. How much more we feel inclined to help those we know something about than strangers, and

in the country we all know one another. In great aggregations of men, sympathy is lost by diffusion who thinks of interrogating the poor crouching creature on the door-step in Belgravia on a bitter winter night,—is there not the Union for her to go to?

Even the furnishing of the Village Hospital is effected, in many cases, by the direct contributions of friends. Thus, at the East Grinstead Village Hospital, a lady supplied the entire furniture of one room, and others gave all kinds of medicinal and surgical appliances, and small matters that go to ease the pain of the invalid. This willingness to aid in the good work renders it comparatively easy to establish and maintain these useful institutions, the value of which is so apparent that they are rapidly spreading throughout the length and breadth of the land. It is not more than fifteen years since the first Village Hospital was established, and now there are twenty in full work, and eighty in course of establishment.

It may be as well, perhaps, if we mention the chief villages in which hospitals are now established. They are as follows:—Bourton-on-the-Water, Gloucestershire; Bungay, Suffolk; Cranley, Surrey; Dorking, Surrey; Capel, Surrey; East Grinstead, Sussex; Fowey, Cornwall; Great Bookham, Surrey; Harrow, Middlesex; Ilfracombe, Devon; St. Andrew's, Fifeshire; Tavistock, Devon; Tewkesbury, Gloucester-

shire ; Weston-super-Mare, Somersetshire ; Wellow, Notts ; and Wrington, Somersetshire. Whilst they are already in the course of formation in the following places :—Amphill, Beds ; Aylesford, Kent ; Bishops Lydiard, Somerset ; Beverley, Yorkshire ; Bertley, Durham ; Bedford, Beds ; Bunbury, Cheshire ; Burbage, Wilts ; Blackheath, Kent ; Clevedon, Somerset ; Chilampton, Somerset ; Cowes, Isle of Wight ; Carlisle, Cumberland ; Cheltenham, Gloucestershire ; Cockermouth, Cumberland ; Congleton, Cheshire ; Devizes, Wilts ; Daventry, Northampton ; Dudley, Worcestershire ; Dorchester, Dorset ; Erdington, Warwick ; Frome, Somerset ; Falmouth, Cornwall ; Folkestone, Kent ; Gainsborough, Lincolnshire ; Grantham, Lincolnshire ; Harpenden, Herts ; Halesworth, Suffolk ; Hurstpierpoint, Sussex ; Highgate, Middlesex ; Harrowgate, Yorkshire ; Hatfield, Essex ; Hartley Row, Herts ; Holywell, Flintshire ; Iver, Berks ; Knutsford, Cheshire ; Kilsyth, North Britain ; Luton, Beds ; Lewes, Sussex ; Leamington, Warwick ; Lichfield, Stafford ; Middlesbrough, Yorkshire ; Marlborough, Wilts ; Market Rasen, Lincolnshire ; Malvern, Worcestershire ; Northwich, Cheshire ; North Cray, Cheshire ; Newton Abbott, Devonshire ; Nantwich, Cheshire ; Penrith, Cumberland ; Redditch, Worcestershire ; Richmond, Surrey ; Walsall, Staffordshire ; St. Austell's, Cornwall ; Shaftesbury, Dorset ; Stoken Church, Oxford ; Loutham, Warwick ;

Savernake, Wilts; Southwill, Notts; Tavistock, Devon; Thetford, Norfolk; Tipton Green, Stafford; Ulverstone, Lancashire; Worthing, Sussex; Walker, Northumberland; Yoxford, Suffolk; Zealand Conyers, Lincolnshire; and possibly others with which we are not yet acquainted.

As many persons, on charitable thoughts intent, will be glad to know the expense of working one of these admirable institutions, we cannot perhaps do better than give the balance-sheet of the working expenses of the Cranley Model for four years, beginning in 1859 and ending in 1863. During this period one hundred patients were treated. their stay varying from a few days to months, and in one instance to nearly an entire year. Many of the surgical cases were of a very severe nature, and we have no doubt whatever that in every case they made far more rapid recoveries, owing to the good air and immediate treatment, than they would have done in the best regulated Metropolitan hospitals, possessing the pick of the surgical skill of the country:—

*Receipts and Expenditure during Four Years for One Hundred Patients.*

*Receipts.*

	£	s.	d.
Donations and Subscriptions . . . . .	542	5	5
From Patients . . . . .	131	4	6
	<hr/>		
	£673	9	11
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*Expenditure.*

	£	s.	d.
For Patients, Salaries, Wine, Beer, etc.	411	5	5
Insurance, Printing, etc. . . . .	34	17	5
Repairs and Improvements . . . . .	73	11	4
Furniture . . . . .	92	11	4
	<hr/>		
	£612	12	6
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If we divide the total expenditure by four, we find that the annual cost, including furniture and repairs, was but little more than £150 per annum. Of course, the two last items of expenditure cannot be looked upon as an annual charge. If we take the mere cost of the patients it but little exceeds a hundred a year for the treatment of twenty-five cases, or five pounds per case. This gives a fair view of the extremely economical method in which these institutions are worked. One of the most encouraging items of receipt is the sum of £131 4s. 6d., contributed by the patients themselves. It is very creditable to our rustic population, that they have set an example to the Metropolitan artisans in this respect, which we trust will not be overlooked. If the peasant with his comparatively low rate of wages can manage to give so much towards his own support whilst debarred from labour, it strikes us that the highly-paid artisan in London, leaning upon rich friendly societies, should

not certainly allow themselves to depend entirely upon charity. It will be seen that the extremely manageable yearly charge of the Cranley Hospital depends upon the total absence of a "staff," that dead weight which sinks more imposing hospitals to the earth. One motherly woman of average intelligence, whose annual salary ranges from £12 to £20 per annum, is found amply sufficient, with a little occasional help, to nurse, whilst a second is employed to do housewifery and cook the food for the inmates, the number of which never exceed six, and but seldom reaches that number. As long as the hospitals can be kept within six or eight beds we have no fear whatever but that they will go on successfully; but we agree with Mr. Napper, that any attempt to get beyond the capabilities of a cottage and a single nurse, with occasional help, will imperil the success of the experiment.

Fowey was the second Village Hospital, established in 1860. A great number of the cases admitted here are sea-faring men, suffering from serious accidents, such as "falling from the mast-head of a ship," "brought on shore from a wreck in a state of great exhaustion," "fracture of a thigh-bone in two places in consequence of falling over the town quay," "falling from the mast-head of a vessel and pitching on his heels." Such cases as these show the value of

Village Hospitals, situated in outlying maritime districts. Dr. Davis, the founder, says that during one year, only £19 0s. 10d. was paid out of the funds of the institution for fifteen patients, "owing to many of them entirely supporting themselves, and partly in consequence of friends supplying dinners, etc., to the sick when required; indeed, I have scarcely ever to *ask* for broth, wine, and other necessaries, but rather to be careful lest my patient gets too many good things, as sympathy is quickly excited, because the cause of it is more brought home to our minds, and soon bears fruit among our townspeople." This is the gist of the matter. When we know the patient and the circumstances of his accident, it is difficult to restrain sympathy and active aid; but directly a poor creature becomes removed far from home the chain of sympathy is broken and lost. Help, in fact, to those in distress is always in a direct ratio to the nearness of the object.

We have shown, we think, pretty clearly that the difficulties in the way of founding a Village Hospital are not by any means formidable, and that we may depend upon the charity of the country-side for the means of establishing and maintaining it. In nearly every instance with which we are acquainted, some gentleman of the district has been found ready to give the free use of a cottage, and by the aid of a bazaar sufficient is speedily raised to furnish the wards.

Where there is no cottage conveniently situated, we have no doubt that some one will be found willing to raise up one for so good a purpose. Indeed, we only fear that the simplicity of the movement will suffer from the too generous gifts of those who give in the name of charity. At the present moment a charming little structure is being raised as a memorial Village Hospital by Mrs. Broadwood at Capel, in Surrey, in memory of her late husband, the Rev. John Broadwood, of Lyne. "It is in the style of the fourteenth century; the walls of Leith Hill sandstone, with Bath stone window-dressings and mullions, and red brick groins; and is calculated to hold twelve beds. We hear it is just finished, and we only hope it is not too fine for the poor country folk it is intended to succour." That a memorial cannot take a better form than that of a Village Hospital we thoroughly admit, but there is a fear lest such a structure be too pretentious, too unlike the homes of the patients themselves to be agreeable to them. At the same time it cannot be denied that the ordinary arrangements of a cottage can be improved upon for the purpose intended, and we must only hope that with the fourteenth-century work we may not also get an attempt at fourteenth-century habits in the form of nursing sisters, who we do not believe would work altogether satisfactorily in Village Hospitals.

Bourton-on-the-Water, established in 1861, was the third Village Hospital. As the letter we have received from its energetic surgeon and founder, Mr. Moore, supplies so many characteristics and instructive particulars, we need make no apology for giving the following quotations from it :—

“The number of beds originally was six, but a new bed-room and convalescent room have been fitted up since, and we can now accommodate eight patients. We have had, up to January 1st, 1866, 164 in-patients, who have contributed, on an average, about 14s. each towards their maintenance (in weekly sums, varying from 2s. 6d. to 5s.), but many subjects of accident or acute disease have been admitted without any payment.

“During the past year we have admitted forty-four new cases, and the daily cost of each patient (every expense inclusive) has been 1s. 5½d.

“We have one nurse, whose wages are 8s. 6d. per week, who has occasional help when the Hospital is full, or when sitters-up are required. She was formerly employed at charing and field-work, but has now become an efficient nurse, keeps the house very clean, and is generally liked by the patients.

“Written orders are sent by Mrs. Moore to the different tradespeople every Monday for the weekly supply of provisions, and she pays the accounts, which

are audited by the committee at their fortnightly meetings.

“ Wines and spirits are kept under lock and key at the Hospital, and are issued by me, a bottle at a time to the nurse when required.

“ Our dietary list is as follows:—Meat, 3 lb. ; sugar,  $\frac{1}{2}$  lb. ; butter, 6 oz. ; for each adult male per week. Milk, rice-pudding, bread, vegetables, and cocoa, at the discretion of the nurse. Wine, spirits, beer, and other diet only by special order of the medical officer.

“ Medicines are supplied by a druggist in the village at the rate of 3s. 6d. per case admitted.

“ The rent is £12 per annum, in addition to interest on money (the produce of a bazaar) expended in alterations. There are four sleeping rooms, one convalescent room, a kitchen, a committee-room (with dark-closet for ophthalmoscopic examinations, etc.), in which out-patients are seen and prescribed for every Monday from 10 to 12. There is also a nurse's room and bath-room, in the latter of which are a hot and cold bath (supplied by a force-pump from the back kitchen below), and a shower bath and a vapour bath.”

Mr. Moore was most ably seconded in his efforts by the Rev. C. W. Payne Crawford, who afterwards removed to East Grinstead, and afforded invaluable sup-

port to the founder in the establishment of that hospital; thus illustrating the value of clerical aid when given with a will. The East Grinstead Hospital has indeed had a great fight for it, and had it not been for the determination of Dr. Rogers and his worthy coadjutor, it would probably have fared but badly. It was the fourth established in order of date, and is a little more pretentious in appearance than the Cranley model, but it retains all the characteristics of a Surrey cottage of the better class, with the addition of a spacious room at the back of the house, amply lighted by two large windows. This addition was made at the expense of its founder, Dr. Rogers. The poor rustic brought here in his hour of trouble must look upon it as a little paradise, surrounded as it is by its well kept little garden, and overlooking a perfect bower of flowers, the culture of which appears to be the hobby of the doctor. This hospital makes up seven beds, and its working expenses are pretty much the same as those at Cranley. The report for a late year is now on our table, from which we gather that during the year, thirty-four cases were treated, against which we find the result "well" recorded in the great majority of cases. The receipts and expenditure of this hospital for the year reported, are equally satisfactory with those of the Cranley Hospital.

*Receipts.*

	£	s.	d.
Balance at the Bankers, Jan. 1 . .	86	12	4
Donations and Subscriptions . .	75	12	6
Payments by Patients . .	33	12	0
Collecting-box at Hospital . .	2	7	6
	<hr/>		
Total . . .	£198	4	4
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*Expenditure.*

	£	s.	d.
Food, wine, medicines, appliances, fuel, etc. . . . .	86	7	4
Nurses . . . . .	17	0	0
Rates, insurance, furniture, and sun- dries . . . . .	6	17	11
Printing . . . . .	5	7	6
	<hr/>		
	115	12	9
Balance . . . . .	82	11	7
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Total . . . . .	£198	4	4
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It will be seen that the receipts from patients were fully a third of the expenditure, bearing out the statement of Mr. Napper that in calculating the means of

support, that rate of support from the patients may always be depended upon.

The Tewkesbury Hospital, which was established in 1866, appears to be making great way, as we might indeed expect it would, considering the size of the town. Dr. Devereux, the founder, informs us it is a simple double cottage, cleaned and whitewashed, but he adds some particulars which are very instructive :—

“ We commenced with five beds ; but within four months the institution was so well appreciated by patients, and its usefulness was so well recognised by the tradesmen of the town, and by the gentry and clergy of the neighbouring parishes, that the number of beds was increased to seven. At the preliminary meetings the great objection urged against a Village Hospital was, that their introduction and general adoption would rob the County Infirmary both of patients and funds. As regards the first, I can safely say that not one of our patients would have found his way to our neighbouring large hospital ; and as for the second part of the objection, I am sure that not one of the subscribers to the large hospital who also subscribe to our Village Hospital would think for a moment of withdrawing it from the Infirmary. And the tradesman of the town, who subscribes his guinea, half-guinea, five shillings, or two-and-sixpence to our

Village Hospital, would never think of subscribing to any of the county infirmaries.

“ Each patient pays a weekly sum towards his maintenance during his stay in the hospital. This sum of course varies according to circumstances, and is fixed by the committee. We find this rule very much appreciated by the patients. We are quite full at present. One patient, a footman, with peritonitis, pays 5s. a week; a boy, aged six, with strumous disease of the knee-joint, requiring splints, etc., whose mother is enabled to visit him daily, 2s. 6d. per week; a man, with a compound comminuted fracture of leg, whose removal to a large hospital at a distance from the place of accident would probably have rendered amputation necessary, pays 2s. 6d. per week; a young blacksmith, with skin disease, requiring medicated baths, which he could not have had at home, pays 7s. per week; a boy with rheumatism, 2s. 6d. per week; and the cook from a gentleman's family, with carbuncle of the leg, 3s. 6d. per week. These sums are paid very willingly, and it is very gratifying to find that former patients frequently visit the hospital, and bring vegetables, flowers, etc., and even money for the hospital money-box. Only lately a poor woman, whose breast was removed on account of carcinoma, gave a donation of one guinea, besides having paid a weekly sum during her stay in the institution.”

This gratitude on the part of old patients is one of the most charming features of the institution. We hear from other sources that it is very common for the friends of convalescent patients to bring flowers to adorn the wards, and to put donations in the box towards the expenses of the hospital.

The question of nursing is the most important matter connected with this movement. As a rule, trained nurses from towns do not work well. They are willing to nurse, but that is only one part of the duty of the motherly person required in a Village Hospital; she must be able to lend a hand to anything, and at the same time be obedient and willing. We should look in vain for such mixed qualities in the highly-trained sisterhoods affiliated to some of our metropolitan hospitals. Mr. Napper is, we hear, engaged upon a nursing scheme, which will, he thinks, meet the wants of the rural districts. His own experience leads him to believe that the staff of nurses he seeks to establish must be selected from the ordinary peasant women of the country, who know the wants of the patients, their habits, and perhaps their failings; and we think there can be no doubt that Mr. Napper is right. Whilst we express this opinion, however, we cannot, in justice to the trained nurses, refuse the testimony of Mrs. Tyrill, of Sunnyside, Ilfracombe, who interests herself so much in the Village Hospital of this charming watering-place. She

speaks most highly of the nurse in that establishment, who was trained for seven years in King's College Hospital. But the hospital must indeed be the *beau ideal* of its class, "standing alone on the hill-side, in a garden of roses and myrtles."

Another question, much discussed, with relation to Village Hospitals, refers to the advisability of establishing fever wards. As we well know, gastric and typhoid fevers are of very common occurrence in the country, and as they are but slightly infectious there appears to be little objection to their admission. It is widely different, however, with scarlet fever, typhus, and small-pox. The general opinion seems to be that if such cases were taken in it would be a death-blow to their success. The hospital would be looked upon as a centre of infection—much, in fact, as the pest-houses were of old—and would be deserted accordingly. We fear there is much truth in this. Isolation could not be sufficiently sustained, even supposing a separate ward were employed for the purpose, with a separate entrance and nurse. We know that such fever cases are admitted into a separate ward of the Children's Hospital in Great Ormond Street, without any evil results; but we fear that two nurses, in an isolated cottage, could not be kept apart so effectually as in a town, for obvious reasons. Moreover, outbreaks of contagious fever are few and far between. When they do happen, they would overtax the supply of

nurses ; and during periods of freedom from an outbreak the ward would be standing idle, at no small expense. Indeed, if fever cases were to be admitted, we do not see why there should not be a ward for contagious skin diseases, for consumption, etc. Once depart from the simple cottage hospital, with one nurse, and the movement would be ruined.

Whilst the importance of these institutions to the labouring poor cannot be over-estimated, the resident gentry will equally participate in the benefit. Under the old style of things, the country was drained of all serious surgical cases. The guardians of the poor, rather than incur the expense of treating severe accidents, and of performing the more serious operations in the workhouses, sent the patients, often suffering the most excruciating agony, to the nearest county or town hospital. The private practitioner, knowing how useless it was to treat such cases in the homes of the patients, often miles away from their own abodes, also recommended their transport to the centres of medical skill. In this manner the county suffered a complete drain of all instructive cases, and the art of the country surgeon became rusted with disuse.

In saying this much we by no means wish to cast a slur upon the skill of the country practitioner, as we well know that in mining and manufacturing districts, where accidents are of frequent occurrence, the resources, the skill, and the quickness of the single-

handed surgeon are often of the highest kind, and would put to shame many a hospital surgeon working with all the appliances of his art, with unlimited help at hand. But manufacturing and mining neighbourhoods are one thing, agricultural neighbourhoods another; and without indorsing the expression we lately met with in a country paper, that country practitioners sooner or later "degenerate into mere pill-making machines," we do not think it can be denied that he gradually loses the greater part of the surgical skill and anatomical knowledge he acquired in the schools; and there are but a small proportion of them who would care to be practically tested, knife in hand, as they were before obtaining their diploma at the College of Surgeons. The knowledge of this fact on the part of the public is, without doubt, one great drawback to a country residence to persons suffering from any bodily affliction which requires constant attention.

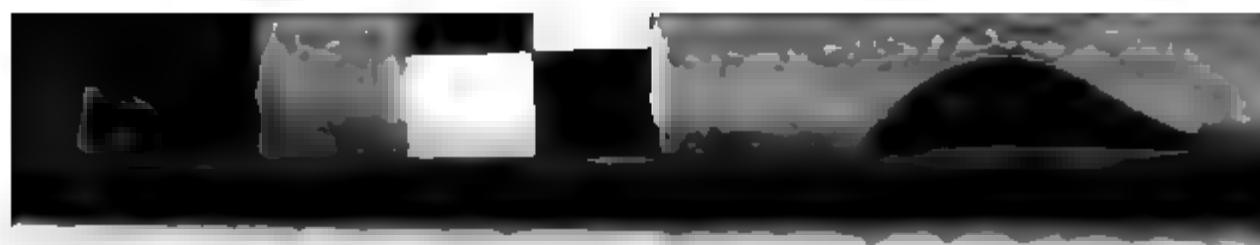
It is not every man that can afford to summon a celebrity from town. Such persons should hail the establishment of Village Hospitals as a boon to themselves, certainly not less than it is to the poor. The country gentleman who gives his annual subscription to maintain one of these valuable institutions must consider that, whilst he is ministering to the wants of the poor, and relieving the parish rates, he is at the same time keeping the village surgeon at school

against the time when some terrible accident overtakes him in the hunting field, or when some sudden emergency to those near and dear to him, calls for the trained and skilful hand.

We cannot conclude this paper, however, without cautioning those inclined to found Village Hospitals—and there should be one in every village ten miles distant from a town or county hospital—that it is not to be done, unless under very favourable circumstances, without great tact and temper. There is rarely any difficulty in procuring sufficient funds, but there are always jealousies to be assuaged and social difficulties to be met and conquered. The surgeon, for instance, who is adventurous enough to establish one is pretty sure to find that his brethren in the neighbourhood look coldly upon him, if he has been unwise enough to do so in direct opposition to their interest or influence; and brother surgeons, it must be remembered, have the ear of the local clergy and gentry, without whose aid it is indeed a hard fight. Not that we think a little wholesome persecution is a bad thing; on the contrary, it always acts as a stimulant. But it should not be too fierce; and this it will be, unless care is taken in interesting as many medical men as possible in its working. In all the most successful institutions of this kind it is a rule to invite every surgeon who sends in a case to attend

it himself, and to give him the option of operating. This rule at once disarms a great deal of jealousy. Union surgeons, by an arrangement with the guardians, are in many cases induced to perform operations in these establishments in preference to doing so in the workhouse; of course receiving the extra fees they are entitled to receive. As a rule, these hospitals are instituted for those above the pauper class, and for such as cannot be properly treated at their own homes; but there are many that receive patients chargeable to the parish, in which case the parish allowance is guaranteed by the parish officers.

We have said enough to show, in the language of the mechanic, that there are "hot bearings," at starting, in the working of the machinery of these invaluable refuges for the afflicted, which require a little of the oil of address and persuasion to mollify; and where this is forthcoming on the part of the founder, all is sure to go well.



## SHOULD OUR WATER BE SUPPLIED BY COMPANIES ?

THE present dear, dirty, and insufficient water supply to London is becoming a nuisance of such magnitude that it is not at all surprising to find the pamphleteer at work upon it ; but many pamphlets are needed, we fear, to awaken the Londoner to the fact that in this essential of life he is treated worse than the inhabitants of any other large town in the kingdom. Glasgow makes a long arm, and draws her water supply from Lake Katrine ; Edinburgh is supplied from the Pentland Hills ; Liverpool, Sheffield, Halifax, and all the manufacturing towns in the north, get pure water from hill sources, but London is bound to eight private companies, which scantily ladle out at an extravagant price the polluted waters of the Thames. It is useless

to expect that these companies would, even if they could, improve their sources of supply. Some of us yet remember the angry pamphlet of Sir William Clay, the spokesman of the water companies, just before the Legislature by its Acts of 1852 accomplished a reform in the quality of the water they supplied, in which he vehemently asserted that better water could not be given than they were serving; and we also remember that at that very time Southwark and Vauxhall were supplied from the river opposite the Red House, Battersea, not far from the spot where the famous Ranelagh sewer poured out all the drainage of Chelsea.

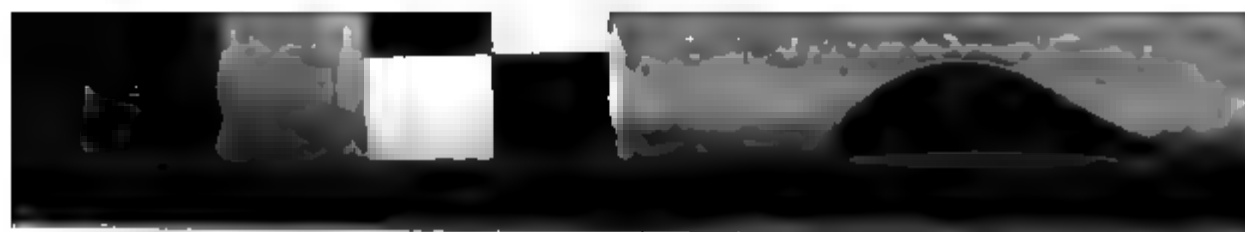
In the last cholera epidemic the poisonous character of this water most unequivocally showed itself. The South London area, which suffered so seriously, was supplied by two companies—the Lambeth Company, which pumped from the river at Thames Ditton, far above the adulterations of London sewage; and the Southwark and Vauxhall Company, drawing its supplies from the impure source we have mentioned. The houses supplied were of the same character, the pipes of the one company in many cases going down one side of the street and those of the other on the opposite side; in fact, there was a duel between comparatively pure *versus* dirty water, under exactly similar circumstances, and the result was just what might have been expected: the deaths from cholera among the people drinking

Thames Ditton water being at the rate of 37 per 1000, and those from the Ranelagh sewer-tainted water of Battersea 130 per 1000, or, as Mr. Simon puts it, "the population drinking dirty water accordingly appears to have suffered three and a half times as much mortality as the population drinking the other water." In the present epidemic the same experiment is repeating itself.

The larger number of cases of cholera occurring in the East of London can be traced to the houses supplied from the Old Ford reservoir of the East London Water Company, which is known to be adulterated with sewage; in short, where foul water is served to the public, whether it be from the Broad-street pump or from a sewage-tainted stream, there we are sure to find cholera upon the track. By the Acts of 1852 all the companies drawing from the Thames were sent up the river for their supply above Teddington Lock. This was a great reform; but no sooner had the Legislature forced the companies higher up towards the sources of the Thames than it set to work to pass bills enabling the large towns upon its banks to drain into its waters. The river below Oxford is so foul that the sewage matter is seen floating on its waters. Windsor, Richmond, and other towns, with an aggregate population of 700,000, are preparing to get rid of their filth by throwing it into our drinking water; in short, one million of inhabitants dwelling in

the valley of the Thames more or less pollute the waters we drink. And it must be remembered sewage is not the only refuse that drains into it. The fields dressed with putrid fish and animal manure of all kinds year by year, as high farming increases, tend to taint the tributary streams flowing into the Thames. That the main stream is to the eye by this means becoming deteriorated is evident enough. Even as high up as Putney it is foul at the present time above all previous recollection, and not only is it becoming foul, but it is becoming shallower yearly. The companies at present draw from sixty to seventy million gallons of water from the Thames per day out of a total flow of not more than 350,000,000, or a sixth of the whole stream flowing past Hampton Court. They are empowered by their Acts to take 100,000,000, and when they do this, they will take more than a fourth of the entire river. We should like to know what in that case would become of the navigation, already so impeded above Putney Bridge. It is exceedingly doubtful whether Parliament will ever allow this limit to be exceeded, in which case where are we to look for the future water supply of the metropolis?

If London grows at the rate it has done during the last twenty years, it will number by 1886 no less than 4,500,000 inhabitants, and these Londoners of the future, it must be remembered, will probably demand



far more water per head than this generation are satisfied with. Indeed, the demand for water is growing at an extraordinary rate. In 1850, only 44,383,332 gallons were delivered daily ; in 1856 it had reached 81,000,000 gallons per day, and it is now at least 110,000,000 gallons. Looking at this increase, it can scarcely be doubted that in twenty years' time we shall need at least 250,000,000 gallons. Now this quantity the existing companies cannot supply.

But the shortcomings of the companies' water is not only in quantity, but in quality. Its hardness, independently of its foulness, is a source of considerable loss to the metropolis. It is estimated that, on account of the very large quantity of carbonate of lime it contains, the loss to the community in soap and soda is not less than £400,000 annually. Soft water, again, is of primary importance in many manufacturing operations, such, for instance, as brewing, or, more familiarly, tea-making. Every woman is aware of this, and that the loss upon tea made with hard water must be enormous. What do we lose again by the use of soda in washing—a most destructive agent, as every housekeeper knows? If we add all these items of waste, entailed upon us by the presence of carbonate of lime in our present water supply, the estimate of loss would probably amount to upwards of a million in the course of the year, to say nothing of the expense every household is put to by the

present intermittent system of supply, which necessitates the use of pernicious leaden cisterns—expensive articles, which would become obsolete upon the introduction of the constant service supply. The reasons then for looking out for new and more abundant sources of water supply are imperative. In ten years' time we shall be in absolute need; and in that period of time we shall have lost more money than would carry us at once to the sources of a pure supply.

When the Metropolitan Board of Works was first established, F. O. Ward, Esq., one of the commissioners, proposed a scheme of water supply which promised to answer all the requirements of the case. His plan was to lay down pipes of collection under the sands of Bagshot Heath and the green sands of Surrey. This extensive tract of land extending over an enormous tract of unproductive heath forms a complete natural filter-bed supplying the purest water. The Hon. William Napier made the survey for the scheme, and Mr. Bateman, we believe, estimated that the cost of collecting and bringing the water to London would only be £1,200,000. The town of Tunbridge is supplied in this manner, and if the sources could be depended upon for the London demand, no better scheme could have been adopted; but the Board of Works decided against it, on the score of a supposed insufficiency of supply. Possibly, however, now that



the subject is discussed anew, we may hear once more of this scheme. Mr. Bateman himself thinks that the moderate amount these gathering grounds could afford would be inadequate, and he now proposes that we should go to the head sources of the Severn for our future supply—a distance of 184 miles. The mountain ranges of Cader Idris and Plynlimmon which form the upper basin of the river are so situated—extending as they do from the south-west to the north-east—as to be peculiarly fitted to catch the large amount of rainfall coming across the Atlantic. He estimates that there are two districts each capable of affording a supply of 100,000,000 gallons per day. This supply could be stored in reservoirs on the spot, from which it would be conveyed by an aqueduct 120 miles, and by pipes and cuttings the remaining distance—passing in its course through Bridgenorth, and near Stourbridge, Bromsgrove, Henley-in-Arden, Warwick, Banbury, Buckingham, Aylesbury, Tring, Berkhamstead, and Watford, to the high ground near Stanmore, where he proposes to construct extensive reservoirs, and to deliver the water therefrom at an elevation of 250 feet above high water mark, thus ensuring a high-pressure constant service over the greater part of London. This water is under 2° of hardness, and contains of organic matter only 1.35 grains per gallon. If more than 200,000,000 gallons a day should be eventually required, there are other ranges

capable of affording another 20,000,000, or indeed of any necessary supply.

But what is the cost of such a work? It is proposed both by Mr. Bateman and Mr. Hemans in the pamphlets before us to use the works of the present water companies for the purposes of distribution, and to purchase their rights, and to provide for the interest on their borrowed capital by an annual charge of £450,000, a sum equal to their present dividends (which Mr. Bateman would capitalize at twenty-five years purchase), and which he thinks they may be inclined to accept. He calculates that the whole scheme can be completed for £10,850,000, and the annual cost he places at £944,000, inclusive of interest on money borrowed for construction. Against this he estimates the receipts to be a sum of £50,000 for the surplus land of the companies to be disposed of; sale of water to districts on the line of the aqueduct, £250,000; compulsory rate of 10*d.* per pound on twelve millions of rateable property, £500,000; and compulsory public rate of 2*d.* on £18,000,000, £150,000—making a total income of £950,000, as against £944,000 of expenditure, which perhaps the reader will think is a very fine margin. It is not proposed, however, to complete the whole scheme at once, but only as much of it as would supply 120,000,000 gallons daily. This Mr. Bateman thinks can be done as far as the works are concerned for £8,600,000, provision being made for the com-

pletion of all the permanent works for the larger quantity.

Bold as this scheme is, it is overshadowed by that of Messrs. Hemans and Hassard, who propose to go for our supply to the Lakes Haweswater, Ullswater, and Thirlmere, and the Rivers Lowther and Greta, in Cumberland and Northumberland, a distance of 240 miles from London. It is unnecessary to go into this scheme of works further than to say that these lakes are to be dammed up and transformed into immense reservoirs, which will rise or fall by many feet, according as they are augmented by floods or drained by drought. As these pieces of water are lonely lakes, with only a score or so of houses upon them, this does not so much matter. The other formidable engineering work is a tunnel under Kirkstone Pass, of seven and a quarter miles in length. Mr. Hemans estimates that these sources of water supply would yield daily 464,719,560 gallons of the purest water, of which he purposes to take 250,000,000. Of which 50,000,000 gallons he proposes should be distributed through the country traversed by the aqueduct. He estimates that £12,200,000 would cover this scheme as far as the works are concerned, of which sum £8,125,000 would be expended on the aqueduct alone. The annual expenses, inclusive of a payment to the water companies of £425,000, he

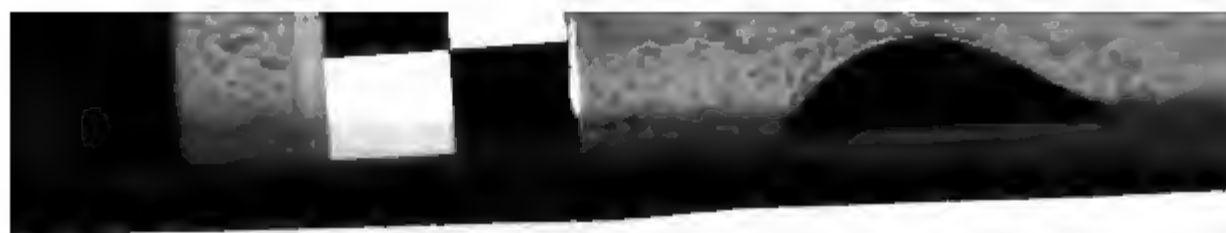
places at £973,000, and he estimates his receipts at £1,031,660, which gives a margin of £58,660, which is certainly a little more liberal than the bare £5,000 of Mr. Bateman; but our readers must take engineers' estimates at what they are worth. Both Mr. Bateman and Mr. Hemans agree that a rate of 10*d.* in the pound upon house property, which the latter estimates at £16,000,000, would be sufficient to defray the domestic supply. We all know what we pay to the companies, and we can therefore estimate whether the change would be to the advantage of the ratepayer in a direct pecuniary point of view. We know that on the score of health the advantage would be infinite, and we can also see that indirectly we should be considerable gainers; but in such cases we will not see our indirect gains, whilst our direct losses are but too painfully apparent.

As a matter of course the management of any such water supply would, of necessity, be confided to some public body, such as the Metropolitan Board of Works. Such a necessary of life as water for the supply of millions should never be permitted to be a source of profit to private companies, who practically charge what they like, inasmuch as it is a complete monopoly in their hands. With compulsory payments we should at least get a board amenable to the ratepayers, and with one central authority and system of management,

we should do away with much present unavoidable waste consequent upon the working of eight distinct systems of management, and, in some cases, with duplicate systems of distribution for the same area of supply.

THE END.







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